

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA IN INFORMATION TECHNOLOGY
Semester: 4

Subject Name: DATA COMMUNICATION AND NETWORKS

Sr.No	Course content
1.	INTRODUCTION 1.1 Structure of communication 1.2 various communication terms (channels, comparison of channels, frequency, wavelength, frequency spectrum and bandwidth) 1.3 Multiplexing (FDM, TDM) 1.4 Advantages of Digital Communication
2.	ANALOG MODULATION 2.1 Definition and need of modulation 2.2 Amplitude modulation 2.3 Frequency modulation 2.4 Phase modulation
3.	NETWORKING CONCEPTS 3.1 Network related terms 3.2 Models of Network Computing (Centralize Computing, distributed Computing, Collaborative Computing) 3.3 Client Server and Peer to Peer Network 3.4 Network Topologies (Bus, Mesh, Star, Ring) 3.5 Various types of computer Network (LAN, MAN, WAN) 3.6 Types of Network Server (File Server, Print Server, Mail Server, Application Server, Database Server, Proxy Server, Web Server)
4.	NETWORK REFERENCE MODELS 4.1 OSI reference model 4.2 Types of Switching Networks (Circuit Switching, Message Switching, Packet switching) 4.3 Comparison and difference of SLIP and PPP 4.4 Connection oriented and connection less services
5.	TRANSMISSION MEDIA 5.1 Selection parameters of Transmission media (Cost, Bandwidth, Installation Attenuation) 5.2 Types of Cables and Connectors (Coaxial, Twisted Pair, Fiber Optic) 5.3 Wireless Media (Infrared, Laser, Microwave, Radio)
6.	NETWORK DEVICES 6.1 Network Adaptor or Interface Card (NIC)

	6.2 Repeater 6.3 Hub 6.4 Switch 6.5 Router 6.6 Brouter 6.7 Bridge 6.8 Gateway
7.	TRANSPORT AND NETWORK LAYER 7.1 Internet Protocol (IP) 7.2 IP address scheme and address classification 7.3 Transmission Control protocol (TCP) 7.4 User Datagram Protocol (UDP) 7.5 TCP/IP reference model 7.6 IPV4 and IPV6
8.	NETWORK APPLICATIONS 8.1 Domain Name System (DNS) 8.2 File Transfer Protocol (FTP) 8.3 Electronic mail (E – Mail) 8.4 ISDN
9.	SATELLITE COMMUNICATIONS 9.1 Types of Satellite Orbits 9.2 Kepler’s laws 9.3 Use of Satellite in Information Technology (internet and Telephony) 9.4 Indian Space Achievements

PRACTICALS

1. Measurement of modulation index of amplitude modulation. - 02 Hrs.
2. Measurement of Freq. deviation of F.M. - 02 Hrs.
3. Build & Test circuit of T.D.M. - 02 Hrs.
4. Build & Test circuit of F.D.M. - 02 Hrs.
5. Study and identification of various cables and connectors- 04 Hrs.
6. Installation of Server OS – 04 Hrs.
7. Installation of Client OS – 04 Hrs.
8. Study of Router and Gateway– 02 Hrs.
9. Understanding the DNS system and IP. – 02 Hrs.
10. Understanding the Internet surfing for Email. – 02 Hrs.

Visit:

Visit of Space Application centre to understand satellite concepts.

Reference Books:

- 1 Data Communication and Computer Network Michael Duck and Richard Read -PHI
- 2.Computer Networks and Internet Douglas Comer-PHI
- 3 Data Communication by William L. Schweber -MGH
- 4.Data & Computer Communication by William Stallings PHI
5. Data Communication & Networks-4e FOROUZEN TMH