

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Biomedical Engineering

Semester: 3

Subject Code

Subject Name DATA COMMUNICATION AND NETWORKING

Sr. No.	Course content
1.	DATA CONDITIONING AND TRANSMISSION 1.1 Definition of Analog and digital signals 1.2 A/D and D/A converters. 1.3 Communication model : Block diagram. 1.4 Pulse Code Modulation. 1.5 Transmission Modes: Simplex, Half Duplex, Full Duplex. 1.6 Asynchronous and Synchronous Transmission. 1.7 Multiplexing Techniques : FDM, TDM 1.8 Routing Techniques: Circuit Switching, Packet
2.	INTRODUCTION TO COMPUTER NETWORK 2.1 Definition of computer network 2.2 Need of computer network 2.3 Network Topologies : Star, Bus, Ring, Mesh 2.4 Type of network LAN, MAN, WAN, Wireless LAN : Bluetooth, WI-Fi 2.5 Brief introduction to OSI and TCP/IP Reference models (Layer) 2.6 Introduction to internet and internet.
3.	3. NETWORK HARDWARE AND SOFTWARE 3.1 Server: client server, file server, print server. 3.2 Transmission media : twisted pair, coaxial, fiber, free space 3.3 Connectors : T, BNC, RJ-45 Terminator. 3.4 Network interface Card (NIC) 3.5 Interconnection devices, Repeater, Bridge, Router, Gateway, Switch, 3.6 Introduction to Software for networks, proxyserver, firewall, network OS 3.7 Maintenance of Network Hardware Tools and software tools.
4.	4. NETWORK APPLICATIONS 4.1 Domain Name System (DNS) 4.2 Electronic Mail 4.3 File Transfer Protocol (FTP) 4.4 Internet tools : WWW, TELNET 4.5 Telex, videotext.
5.	5. INTEGRATED SERVICES DIGITAL NETWORKS (ISDN) 5.1 Introduction to ISDN 5.2 Data communication 5.3 Inter networking 5.4 Broad band ISDN 5.5 Voice and data integration.

LABORATORY EXPERIENCES :

Sr. No.	Name of experiment
1.	To demonstrate various network topologies
2.	To prepare computer system for network
3.	To install and test Ethernet network interface card
4.	To install and test various network connection, cables
5.	To install network client server
6.	To install network file server
7.	To install network print server
8.	To perform pulse code modulation
9.	To perform time division multiplexing
10.	To perform frequency division multiplexing
11.	To demonstrate the transmission of signal various
12.	To study broadband ISDN
13.	To install internet
14.	To access internet
15.	To access e-mail accounts
16.	Study of Router, repeater and Bridge

Reference Books:

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|--|--------------------|-----|
| 1. Computer networks | Andrew S Tanenbaum | PHI |
| 2. Computer networks & Internet | Comer & Droms | PHI |
| 3. Data and Computer Communication | Stallings | PHI |
| 4. Telecommunication switching system & networks | T Vishwanathan | PHI |
| 5. Data communication & Networking | Forouzan | PHI |