

# GUJARAT TECHNOLOGICAL UNIVERSITY

## B.E. SEMESTER : VIII

### ELECTRONICS ENGINEERING

Subject Name: **DATA COMMUNICATION AND NETWORKING**

Sr. No.	Course Contents	Total Hrs
1.	<b>INTRODUCTION:</b> Network Hardware, Topology, Network Software, Reference Models, Example Networks, Uses of Computer Networks, ARPANET, Connection Oriented Networks, X.25, Frame Relay, ATM	5
2.	<b>PHYSICAL LAYER:</b> The Theoretical Basis for Data Communication, The Public Switched Telephone Network, The Mobile Telephone System	4
3.	<b>DATA LINK LAYER:</b> Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols	7
4.	<b>MEDIUM ACCESS CONTROL SUB LAYER:</b> The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, RFID, Data Link Layer Switching	11
5.	<b>NETWORK LAYER:</b> Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.	9
6.	<b>TRANSPORT LAYER:</b> The Transport Service, Elements of Transport Protocols, Congestion Control Algorithms, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP, Performance Issues, Delay Tolerant Networks.	7
7.	<b>APPLICATION LAYER:</b> DNS--The Domain Name System, The World Wide Web, Real-time Audio and Video, Content Delivery and Peer-To-Peer, SMTP and HTTP Protocol	5
8.	<b>NETWORK SECURITY:</b> Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures, Management Of Public Keys, IPsec, Firewalls, Virtual Private Networks, Wireless Security, Security Issues And Challenges in Wireless Networks, Authentication Protocols, Email Security, Web Security, Social Issues	8

**Practical/TW :** Practical / Term Work [minimum 8-10 experiments based on above topics.]

#### Reference Books:

1. Computer Networks, Andrew Tanenbaum, 5<sup>th</sup> Edition, Pearson Education.
2. Data Communication And Networking, Behrouz Forouzan, 4<sup>th</sup> Edition, TMH.
3. Introduction to Data Communication and Networking, Wayne Tomasi, Pearson