

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

Subject Name: **DATA COMMUNICATION AND NETWORKING**

| Sr. No. | Course Contents | Total Hrs |
|---------|---|-----------|
| 1. | INTRODUCTION: Network Hardware, Topology, Network Software, Reference Models, Example Networks, Uses of Computer Networks, ARPANET, Connection Oriented Networks, X.25, Frame Relay, ATM | 5 |
| 2. | PHYSICAL LAYER: The Theoretical Basis for Data Communication, The Public Switched Telephone Network, The Mobile Telephone System | 4 |
| 3. | DATA LINK LAYER: Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols | 7 |
| 4. | MEDIUM ACCESS CONTROL SUB LAYER: The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, RFID, Data Link Layer Switching | 11 |
| 5. | NETWORK LAYER: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet. | 9 |
| 6. | TRANSPORT LAYER: 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. | APPLICATION LAYER: 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. | NETWORK SECURITY: 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, 5th Edition, Pearson Education.
2. Data Communication And Networking, Behrouz Forouzan, 4th Edition, TMH.
3. Introduction to Data Communication and Networking, Wayne Tomasi, Pearson