GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Electrical Engineering

Subject Name **DATA COMMUNICATION & NETWORKING (MICRO GROUP)**

Sr.No	Course content
1.	Media and DATA TRANSMISSION, Signal Encoding Techniques Concepts and Terminology; Analog and Digital Data Transmission; Transmission Impairments; Channel Capacity. Guided Transmission Media; Wireless Transmission. Digital Data, Digital Signals; Digital Data, Analog Signals; Analog Data, Digital Signals; Analog Data, Analog Signals.
2.	DIGITAL DATA COMMUNICATION TECHNIQUES Asynchronous and Synchronous Transmission; Error Types and Detection; Line Configurations. Synchronous transmission, Circuit and packet switching, network architecture and the OSI model.
3.	Bus Standard RS 232C, RS 4 22, RS423, RS 485, GPIB 488 (I.C used for all above standards) VME, VXI, Multibus, PC Bus, Eurobus.
4.	The Physical Layers Physical layer, Modems, V-series standards, interfacing, RS232C, RS449, X 21, PBX, ISDN, ATM; Medium Access Polling token passing and random access, LANs IEEE 802.n procedures, ALOHA protocols, Demand assignment, SPADE and PODA protocols, Packet radio, FDDI
5.	Data Link Layers; Datalink layer design, issues, error handling and flow control, CRC, checksum, ARQ, sliding window protocols, HDLC, SDLC, BSC, XMODEM protocols
6.	CIRCUIT SWITCHING AND PACKET SWITCHING Switched Communications Networks; Circuit Switching Networks; Packet-Switching Principles. Routing in Packet-Switching Networks; Least-Cost Algorithms CONGESTION CONTROL IN DATA NETWORKS Effects of Congestion; Congestion Control; Traffic Management; Congestion Control in Packet Switching Networks. Network layer routing algorithms, Congestion control, Internetworking and routers, servers, repeaters, gateways, bridges etc. Network layer protocols - X.25, X.75, Internet protocol (IP).
7.	Communication hardware and software: Communication front and architecture, hardware and software, network administration, data organization, file management, application software

Reference Books:

1. Data Communication by F W Stallings
2. Telecommunication Networks By Schwartz
3. Data Communication and Distributed Networks By Black
4. H. Kopetz, Real-Time Systems: Design Principles for Distributed Embedded Applications, Kluwer