

B.E. ELECTRONICS ENGINEERING	
FOURTH YEAR SEMESTER VIII	
SUBJECT: Data Communication and Networking	
Lectures: 4 Hrs per week Practical: 2 Hrs per week	Theory: 100 Marks Term Work: 25 Marks Oral: 25 Marks
<i>Rationale: This subject introduces the fundamental concepts of data network architecture. Starting with the key aspects of transmission, interfacing, link control and multiplexing, it covers the internal mechanisms and network interfaces that have been developed to support data communications over long distance networks and over short distance.</i>	
DETAILED SYLLABUS	
Introduction	
Network , Protocols and standards, Line configuration, Topology, Transmission modes, categories of networks, Internetworks, Transmission media, Transmission Impairments, Performance of Transmission media, The OSI model, TCP/IP, DTE - DCE interface.	
Multiplexing	
FDM, Synchronous TDM, Statistical TDM, Asymmetric Digital subscriber lines, XDSL.	
Data Link Control	
Flow control, Error detection - two dimensional Parity checks, Internet checksum, CRC. Error control, Transmission efficiency of ARQ protocols, HDLC, point to point protocol.	
Circuit switching	
Circuit switching networks, circuit switches - space division switches, Time - division switches, Time - space - time switches, Routing in circuit switching Networks, control signaling, SS7.	
Packet Switching Networks	
Network services and internal network operation, packet network topology, Datagram and Virtual circuits, Routing in packet networks, shortest path algorithms - The Bellman - Ford algorithm, Dijkstra's algorithm, other Routing approaches, congestion control.	
ATM and Frame Relay	
ATM protocol Architecture, Logical connections, ATM cells, Transmission of ATM cells, ATM Adaptation Layer, Frame Relay, Frame Relay protocol Architecture.	
Local Area Network	
LAN Applications, LAN architecture, Bus LANs, Ring LANs, Star LANs, Wireless LAN, LAN Bridges, IEEE 802.3 Medium Access control for 10 Mbps and 100 Mbps LAN, Token Ring and FDDI.	
ISDN	
Architecture, ISDN channels, User Access, ISDN Protocols, Broadband ISDN	

BOOKS
Text Books:
1. William Stallings, Data and computer communication - Pearson Education , sixth edition [Topics 2,3,4,6,7,8] 2. Leon Garcia and Widjaja, Communication Networks, Tata McGraw Hill, second edition [Topics 3,4,5] 3. Forouzan, Data Communication and Networking, Tata McGraw Hill, third edition [Topic 1]
Additional Reading:
2. William A Shay - Understanding Data communications and Networks - Thomson Learning. 3. Andrew Tenenbaum, Computer Networks, Prentice Hall of India
TERM WORK
Term work shall consist of at least eight practicals and two assignments covering the topics of the syllabus. A term work test shall be conducted with a weightage of 10 marks.
ORAL EXAMINATION
An oral examination is to be conducted based on the above syllabus.