

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.E. THIRD YEAR

ELECTRONICS & COMMUNICATION

(In Force June 2006)

SEMESTER – VI

EC 605: DATA COMMUNICATION & NETWORKING

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./ Viva Marks	Term Work Marks	Total Marks
3	2	3	100	25	25	150

SYLLABUS

1. **Introduction to Data Communication and Networking:** Data communication, use of Networks, Internet Protocols and standards, layering of Models, OSI model, Internet model.
2. **Physical Layer:** Transmission media (Twisted pair, Coaxial cable, Fiber optic cable), Wireless Medium as Physical Layer (Electromagnetic Spectrum, ISM Band, Lighwave Transmission), Circuit switching, Telephone network, DSL technology, Cable modem, SONET/SDH
3. **Data Link Layer:** Services to N/W layer, Framing, Bit Stuffing, Character Stuffing, Error Correction, Error control, Flow control mechanism stop & wait, Go-back-, Selective repeat. Example data link protocol HDLC, PPP.
4. **Medium Access Layer:** Channel allocation problem, Multiple Access, CSMA, CSMA/CD, CSMA/CA
5. **Local Area Network:** Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN, Blue tooth, connecting devices- Repeaters, Hub, Bridges, Switch, Router, Gateways, Virtual LAN, Broadband Wireless Networks
6. **Example Networks:** X.25, Frame Relay, ATM, ISDN
7. **Network Layer:** Packet Switching, Virtual circuits and data gram, Static and Dynamic Routing Algorithms (Optimality principle, Static Routing Algorithms, Shortest Path, Flooding, Dynamic routing Algorithms, Distance Vector, Link state routing.), IP Addressing, CIDR & NAT, IP layer protocols (ICMP, ARP, RARP, DHCP, BOOTP,), IPv6, Congestion control Algorithms (Principles, policies, Algorithms), QoS- Quality of Service (Integrated Services & Differentiated Services)
8. **Transport layer:** Elements of Transport protocols, Internet protocols - TCP & UDP.
9. **Application Layer:** DNS- Domain Name System, E-mail, FTP.
10. **Network Security:** Cryptography, Symmetric key Algorithms, DES, AES, Public key Algorithms, RSA, Digital Signatures, Firewall, IPsec

REFERENCE BOOKS:

1. Computer Networks, by A.S. Tanenbaum, PHI
2. Data and Communication Networking, by Behrouz Forouzan, TMH
3. Communication Networks, by Widjaja