

Data Communications And Networking		
	Lectures: 4 Hrs/week One paper: 100 marks / 3 Hrs duration Term Work : 25 marks	Practical: 3 Hrs /week Practical exam: 50 marks
1	Fundamental in communication Concepts of data transmission Signal encoding Synchronization Coding methods Multiplexing -FDM -TDM -WDM Modulation methods -Amplitude -Frequency -Phase Frequency, phase and digital modulation such as PAM, PWM, PCM. Modes of communication Simplex Half Duplex Full Duplex. Switching techniques Circuit switching Message switching Packet switching.	(6hrs)
2	Introductions Uses of computer network, LANs, MANs, WANs, Wireless Networks, Internetwork The OSI Reference Model The TCP/IP Reference model A comparison of the OSL and TCP Reference Models	(4 hrs)
3	The Physical layer Transmission Media- Magnetic media Twisted Pair Coaxial Cable Fiber optics Wireless Transmissions The electromagnetic Spectrum Radio Transmission Microwave Transmission Infrared and millimeter Waves Light wave Transmission.	(3 hrs)

4	<p>The Data link layer Data Link Layer Design Issues Error detection and correction Elementary Data Link Protocols Sliding Window Protocols Example – HDLC</p>	(7 hrs)
5	<p>The Medium Access Sub layer. Multiple Access Protocols ALOHA (Pure, slotted, Reservation) Carrier Sense Multiple Access Protocols Collision free Protocols. IEEE Standard 802.3, 802.4, 802.5,802.6 High speed LANs – FDDI Satellite Networks – Polling, ALOHA, FDMA, TDMA, CDMA, categories of satellites – GEO, MEO, LEO</p>	(6 hrs)
6	<p>The Network Layer Network Layer Design Issues Routing Algorithms The Optimality Principal Shortest Path Routing Flooding Distance Vector Routing Link state Routing Broadcast Routing Multicast Routing. Internetworking The Network layer in the Internet – Address mapping (ARP, RARP, BOOTP, DHCP), IP Addresses, Subnets, IP Protocols –Ipv4, IPv6, ICMP, IGMP</p>	(7 hrs)
7	<p>The Transport Layer The Transport Protocols The Internet Transport Protocols – The TCP Services Model, The TCP protocol and The TCP Segment Header, UDP Congestion control and quality of service</p>	(6 hrs)
8	<p>The Application layer WWW, HTTP, DNS, SNMP, FTP, Remote logging, E-mail, Cryptography, symmetric key and asymmetric key cryptography, DES, RSA algorithms, security services – message and entity</p>	(6 hrs)
	<p>Term Work :- Term work/Assignment :- Each candidate will submit a journal in which at least 10 assignments based on the above syllabus and the internal test paper. Test will be graded for 10 marks and assignments will be graded for 15 marks.</p>	

	<p>References:</p> <ol style="list-style-type: none"> 1. Tanenebaum A. S- Computer Network (3rd ed) – 2. Stalling William – Data Computer Communications 3. Computer communications & Networking Technologies Michael A. Gallo and William M. Hancock Thomson 4. Data Communication and Computer Networks ISRD Group The Tata McGraw-Hill Companies 5. Behrouz Forouzan – Data Communications and networking TMH publication 6. Douglas Comer – Data Communication 7. Jerry FitzGerald, Alan Dennis - Business data communications and networking (8th edition) Wiley publication 8. Black U – computer Network – Protocols, Standards and Interfaces. 9. Youlu Zheng, Shakil Akhtar – Networks for Computer Scientists and Engineers 	
	<p>DCN Practical List</p> <ol style="list-style-type: none"> 1. Write a program to implement VRC and LRC method. 2. Write a program to implement CRC where user will accept the data and the CRC polynomial. 3. Write a program to implement checksum method. 4. Write a program to check and correct the error in the data at receiver end by implementing hamming code. 5. Write a program to generate chipping sequence using Walsh matrix method. 6. Write a program to implement character level encryption by monoalphabetic encryption method. 7. Write a program to implement character level encryption by polyalphabetic encryption method. 8. Write a program to implement stop and wait ARQ. 9. Write a program for shortest path routing algorithm (Dijkstra's algorithm). 10. Write a program to generate sink tree for given network. 11. Write a program to implement DES algorithm using C. 12. Write a program to implement sliding window protocol using C. 13. Write a program to implement (Go back n) allows multiple outstanding frames using C. 14. Write a program to implement client server application using C. 15. Write a program to implement Distance Vector Routing algorithm using C. 16. Write a program to demonstrate setting up a simple dumbbell network by setting up TCP connection using NS2. 17. Write a program to implement network topology for 4 to 6 nodes using UDP connection using NS2 simulator. 18. Write a program to implement Unicast or Multicast routing between the source node and destination node. 19. Write a script in NS2 to implement Diffserv. 	

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