

Guidelines for B.Sc. (Hons) Computer Science (NEP)
DISCIPLINE SPECIFIC CORE COURSE– 12 (DSC-12): Computer Networks
Semester III

Unit	Topic	Chapter Section / Pages	Reference	Hours
I	Introduction: Types of computer networks, Internet, Intranet, network topologies (bus, star, ring, mesh, tree, hybrid topologies), network classifications. layered architecture approach, OSI Reference Model, TCP/IP Reference Model. Transmission Modes: simplex, half duplex and full duplex.	Ch 1: 1.1 to 1.3 Ch 2: 2.1 to 2.4	[2]	8
2	Physical Layer: Analog signal, digital signal, the maximum data rate of a channel, transmission media (guided transmission media, wireless transmission, satellite communication), multiplexing (frequency division multiplexing, time-division multiplexing, wavelength division multiplexing). Guided Media (Wired) (Twisted pair, Coaxial Cable, Fiber Optics. Unguided Media (Radio Waves, Infrared, Microwave, Satellite).	Ch 3: 3.1, 3.5 Ch 4: 4.1 before Multilevel Schemes Ch 6: 6.1 upto Interleaving, before example 6.8 Ch 7: 7.1, 7.2	[2]	9
3	Data Link and MAC Layer: Data link layer services, error detection and correction techniques, error recovery protocols (stop and wait, go back n, selective repeat), multiple access protocols with collision detection, MAC addressing, Ethernet, data link layer switching, point-to-point protocol.	Ch 3: 3.1, 3.2 - 3.2.1 till pg 207 (till Hamming Code), 3.2.2 Ch 11: 11.3,11.4, 11.5, 11.7 before Transition Phase Ch 4: 4.2.2, 4.3.2 Ch 2: 2.6.5	[1] [2] [1] [1]	10
4	Network layer: Networks and Internetworks, virtual circuits and datagrams, addressing, subnetting, Dijkstra Routing algorithm, Distance vector routing, Network Layer protocol- (ARP, IPV4, ICMP).	Ch 5: 5.1, 5.2 (5.2.1, 5.2.2, 5.2.3, 5.2.4), 5.6(5.6.1, 5.6.2, 5.6.4	[1]	8
5	Transport and Application Layer: Process to process Delivery- (client-server paradigm, connectionless versus connection-oriented service); User	Ch 6: 6.1.1, 6.4 upto 6.4.1, 6.5.3, 6.5.4 Ch 7: 7.2.4, 7.3- 7.3.1	[1] [1]	10

	Datagram Protocols, TCP/IP protocol, Flow Control. FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), Telnet (Remote login protocol), WWW (World Wide Web), HTTP (HyperText Transfer Protocol), URL (Uniform Resource Locator).	till pg. 652 (before MIME Type), 7.3.4 (before Message Headers) Ch 26: 26.3 before example 26.4	[2]	
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Essential/recommended readings

- [1]. Tanenbaum, A.S. & Wethrall, D.J.. Computer Networks, 5th edition, Pearson Education, 2012.
 [2]. Forouzan, B. A.. Data Communication and Networking, 4th edition, McGraw-Hill Education, 2017.

Additional References

1. Comer, D. E.. Computer Networks and Internet, 6th edition, Pearson education, 2015.
2. Stallings, W., Data and Computer Communications, 10th edition, Pearson education India, 2017.

Practical Guidelines (To be simulated using Cisco Packet Tracer):

1. To study basic network command and network configuration commands
2. To study and perform PC to PC communication using ethernet
3. To create Star topology using hub and switch
4. To create Bus, Ring, Tree, Hybrid, Mesh topologies
5. Perform an initial Switch configuration
6. Perform an initial Router configuration
7. To implement Client Server Network
8. To implement connection between devices using router
9. To perform remote desktop sharing within LAN connection