Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-502	Computer Networks	PCC	4	3	1	0	50	100	150

Course Outcomes:

At the end of the course the student will be able to:	
CO1	Articulate the fundamental concepts in computer networks and justify their layered implementation.
CO2	Appreciate the challenges involved and available protocols for facilitating low-level data communication.
CO3	Analyze the design issues in ensuring error free data construction, deconstruction and transmissionacross devices.
CO4	Justify the application of appropriate routing algorithms in different scenarios based on throughUnderstanding of prevalent routing algorithms.
CO5	Articulate the role of higher network layers in the OSI models and the working of common network Applications.

Detailed Syllabus
Section A

Unit 1: Introduction: Data Communication-communication system, synchronous and asynchronous systems, serial and parallel systems, dataflow-simplex, half-duplex, full-duplex, computer network-uses of computer network, categories of computer networks, protocol and standards, Reference Model-OSI and TCP/IP reference model, their comparison and critique, Network Topologies. **(12 Hrs)**

Unit 2: Physical Layer: Data Transmission-Digital to Digital Conversion-Line Coding Scheme, Transmission Media, RS-232 Interface, Switching mechanisms and Comparison –circuit, packet, message, Modem and its types. **(11 Hrs)**

Unit 3: Data Link Layer: Design Issues, Error Detection and Correction, Flow Control-Elements of data link protocol, Sliding Window Protocol, Example of Data Link Protocol (HDLC), Channel Allocation Problems, Multiple Access Protocol-ALOHA, Carrier Sense Multiple Access Protocols, Collision Free Protocols, IEEE standards-802.3, 802.4, 802.5. **(9 Hrs)**

Section B

Unit 4: Network Layer : Design Issues, Routing Algorithms–the optimality principle, shortest path algorithm, flooding, distance vector routing, link state routing and hierarchical routing, Congestion Control- principles prevention policies, congestion control in virtual circuit subnet and datagram subnets, Traffic shaping algorithm - leaky bucket algorithm, token bucket algorithm, QOS, IP protocol, IP addresses, Internet Multicasting, Introduction to IPV6, IPV4 vs. IPV6, Internetworking devices –concept of Internetworking, Repeaters, Hub, Bridges, Switches, Routers, Gateways. **(8 Hrs)**

Unit 5: Transport, Session, Presentation and Application Layer: Transport Layer Services, Primitives, Issues, elements of transport protocol, Introduction to TCP and UDP, Design Issues, FTP, DNS, E-Mail, Introduction to WWW, Firewalls. **(8 Hrs)**

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Computer Networks: A System Approach	W. Stallings	Pearson Education	2nd (2010)
2	Computer Networks: A System Approach	L. L. Peterson	Morgan Kauffman	5th (2011)

Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Computer Networking: A Top-Down Approach Featuring the Internet	Kurose & Ross	Pearson Education	3rd (2005)
2	Computer Networks and Internets with Internet Applications	Coumar & Douglas	Prentice Hall	4th (2004)