C. Syllabus Detailing and Learning objectives

Module	Chapter	Detailed Content	Syllabus Detailing	Learning Objectives
Module 1	**Chapter 1** - Introduction	History and development of computer network, network application, network software and hardware components, topology, protocol hierarchies, design issues for the layers, connection oriented and connectionless services, reference models: layer details of OSI, TCP/IP models. Communication between layers	**Purpose –** This chapter describes basics of networking and OSI and TCP Model **Scope –** **1. Academic Aspects-** Explain basics of Networking, Design issues of layers **2. Technology Aspect-** Compare the OSI and TCP Models 3**. Application Aspect-** Develop a program to implement the protocols. **Student Evaluation –** 1. Theory and viva questions on topology, Network hardware and software components 2. Describe the OSI Model 3. Describe TCP Model.	Student will be able to: 1. 1. State various topologies.**(R)** 2. Draw architecture of ISO OSI Model**.(R)** 3. Express Pros and Cons of Star Topology**.(U)** 4. Explain functions of ISO OSI Layers**.(U)** 5. Draw diagram of STAR and BUS topology..**(R)** 6. State 4 applications of Computer Network..**(R)** 7. State the Layers of TCP/IP Model along with diagram..**(R)** 8. Draw diagram of Mesh and Ring topology**.(R)** Distinguish between the OSI Model and TCP-IP Model.**(U)**

Module 2	Chapter 2 - Physical Layer	Guided Transmission Media: Twisted pair, Coaxial, Fiber optics. Unguided media (Wireless Transmission): Radio Waves, Bluetooth, Infrared, Virtual LAN	**Purpose –** Study of various Guided and UnGuided Media	Student will be able to:
			Scope – **1. Academic Aspects-** Describe Difference between guided and unguided media **2. Technology Aspect-** Understanding and comparison of guided and unguided media **3. Application Aspect-**	1. Distinguish between Twisted Pair cable, Optical Fibre Cable and Coaxial Cable.(U) 2. Distinguish between Guided Media and Unguided Media.(U) 3. Explain Bluetooth Piconet and Scatternet.(U) 4. Describe Infrared with example.(R)
			Student Evaluation - 1. The student will know the difference between guided and unguided media. 2. Study basics of Bluetooth and Virtual LAN	
Module 3	Chapter 3 - Data link Layer and MAC Layer	DDL Design Issues, Functionalities of DLL, Flow control algorithms - Sliding Window, Error Detection & Correction techniques, SDLC, PPP, Framing. Aloha protocols, Control Access Protocol, Carrier	**Purpose –** Study of Design Issues, Flow Control, Error Control and MAC Protocols.	Student will be able to
			Scope – **1. Academic Aspects-** Describe Concept of Flow Control and Error Control and MAC Protocols. **2. Technology Aspect-** Understanding and comparison of various error control techniques **3. Application Aspect-**	1. List the Design issues of Data Link layer.(R) 2. Explain the services provided by the data link layer to the network layer.(U) 3. Distinguish between Unacknowledged connectionless service, Acknowledged connectionless service and

		Sense Multiple Access(CSMA), Ethernet, Local Area Networks - Ethernet, Token ring, FDDI.	**Developing a program for Framming, Hamming Code, CRC,** **Student Evaluation -** 1. The student will get motivation Framming techniques, Error Control Techniques. 2. Study basics of Flow Control Techniques 3. Viva question on Design Issues, CSMA	Acknowledged connection-oriented service.(U) 4. Draw Diagram of Go Back N protocol and Selective Repeat Protocol.(R) 5. Explain design issues of Data link Layer.(U) 6. Generate the Hamming Code for the data 111011001 with even parity.(A)
Module 4	**Chapter 4 -** Network Layer	Communication Primitives: Unicast, Multicast, Broadcast. IP Addressing, Subnetting, IPv4, IPv6, Routing algorithms : Link state routing, Distance Vector Routing, ARP, RARP, ICMP, Routing protocols - RIP, OSPF, BGP,	**Purpose –** Study of Routing Protocols, Congestion Control, IP Addressing and IP Header Formats. **Scope –** **1. Academic Aspects-** Describe the concept of Header Formats, IP Addressing. **2. Technology Aspect-** Understanding and comparison of Routing Protocols, Congestion Control concepts. **3. Application Aspect-** **Developing a program to compare the Routing Algorithms.**	Student will be able to: 1. Distinguish between Unicast, Multicast and Broadcast Communication.**(U)** 2. Draw the IPV6 and IPV4 Header Formats.**(R)** 3. Apply the concept of Subneting to solve problems. **(A)** 4. Describe the congestion control algorithms(R). 5. Distinguish between the Routing Protocols(U)

		IGRP, Congestion control algorithms: Open Loop congestion control, Closed Loop congestion control.	**Student Evaluation -** 1. The student will get motivation to implement the routing protocols. 2. study basics of congestion control algorithms. 3. Viva question on IP Addressing.	
Module 5	**Chapter 5 Transport Layer**	The Transport Service: Transport service primitives, Berkeley Sockets, Connection management, UDP, TCP, Socket Programming (TCP & UDP), Socket Programming examples, TCP Flow control, TCP Congestion Control, Multiplexing	**Purpose –** Understand the concept of TCP and UDP. The students will develop an understanding of Socket Programming using TCP and UDP.	1.Describe the TCP and UDP Protocols.(R) 2. Explain the concept of TCP Flow Control (U) 3. Apply the concept of Socket Programming for communication between two computers. (A) 4.Explain the concept of TCP Congestion Control.**(U)**
			Scope – **1. Academic Aspects-** To learn the TCP and UDP Protocol. **2. Technology Aspect-** Compare the Protocols. **3. Application Aspect-** Develop a program using the concept of socket programming for communication of computers.	
			Student Evaluation - 1.Questions based on TCP and UDP. 2. Lab experiments based on Socket Programming. 3. Mini project: Exchange of Files between two mach .	
Module 6	**Chapter 6** Application Layer **Chapter 7** Network	DNS, HTTP, E-mail, SMTP, Telnet, FTP, Security-PGP-SSH SNMP Concept, Management Components, SMI,	**Purpose –** **This chapter describes the protocols of Application layer. It also focuses on the network Management concepts like SNMP and SMI.**	1. Describe the application layer protocols.(U) 2. Explain the concept of SNMP. (U) 3. Draw the SNMP format.(R)
			Scope – **1. Academic Aspects-** Explain the concepts of SNMP and SMI. **2. Technology Aspect-**	

	Managem ent	MIB, SNMP Format, Messages.	Compare the Application layer protocols. 3**. Application Aspect-** Develop a program to implement the protocols.	
			Student Evaluation – 1. Theory and viva questions on Application layer protocols. 2. Describe the SNMP Concept. **3.** GATE questions on Application Layer Protocols..	