SHORT SYLLABUS

BCSE308L Computer Networks (3-0-0-3)

Network models - Error detection and flow control in data link layer - Network layer – IPv4, IPv6 - Routing algorithms - Sub-netting - Classless addressing – NAT - Transport layer - Sliding Window revisited - Flow and congestion control - Application layer Protocols - Basics on network security.

BCSE308L	Computer Networks	L	T	P	C
		3	0	0	3
Pre-requisite	**NIL**	**Syllabus version**			
		1.0			

Course Objectives

1. To build an understanding among students about the fundamental concepts of computer networking, protocols, architectures, and applications.
2. To help students to acquire knowledge in design, implement and analyze performance of OSI and TCP-IP based Architectures.
3. To identify the suitable application layer protocols for specific applications and its respective security mechanisms.

Course Outcomes

On completion of this course, student should be able to:

1. Interpret the different building blocks of Communication network and its architecture.
2. Contrast different types of switching networks and analyze the performance of network
3. Identify and analyze error and flow control mechanisms in data link layer.
4. Design sub-netting and analyze the performance of network layer with various routing protocols.
5. Compare various congestion control mechanisms and identify appropriate transport layer protocol for real time applications with appropriate security mechanism.

Module:1	**Networking Principles and Layered Architecture**	**6 hours**

Data Communications and Networking: A Communications Model – Data Communications - Evolution of network, Requirements , Applications, Network Topology (Line configuration, Data Flow), Protocols and Standards, Network Models (OSI, TCP/IP)

Module:2	**Circuit and Packet Switching**	**7 hours**

Switched Communications Networks – Circuit Switching – Packet Switching – Comparison of Circuit Switching and Packet Switching – Implementing Network Software, Networking Parameters(Transmission Impairment, Data Rate and Performance)

Module:3	**Data Link Layer**	**8 hours**

Error Detection and Correction – Hamming Code , CRC, Checksum- Flow control mechanism – Sliding Window Protocol - GoBack - N - Selective Repeat - Multiple access Aloha - Slotted Aloha - CSMA, CSMA/CD – IEEE Standards(IEEE802.3 (Ethernet), IEEE802.11(WLAN))- RFID- Bluetooth Standards

Module:4	**Network Layer**	**8 hours**

IPV4 Address Space – Notations – Classful Addressing – Classless Addressing – Network Address Translation – IPv6 Address Structure – IPv4 and IPv6 header format

Module:5	**Routing Protocols**	**6 hours**

Routing-Link State and Distance Vector Routing Protocols- Implementation-Performance Analysis- Packet Tracer

Module:6	**Transport Layer**	**5 hours**

TCP and UDP-Congestion Control-Effects of Congestion-Traffic Management-TCP Congestion Control-Congestion Avoidance Mechanisms-Queuing Mechanisms-QoS Parameters

Module:7	**Application layer**	**3 hours**

Application layer-Domain Name System-Case Study : FTP-HTTP-SMTP-SNMP

Module:8	**Contemporary Issues**	**2 hours**
	Total Lecture hours:	**45 hours**

Text Book

1. Behrouz A. Forouzan, Data communication and Networking, 5th Edition, 2017,

	McGraw Hill Education.		
Reference Books			
1.	James F. Kurose and Keith W.Ross, Computer Networking: A Top-Down Approach, 6th Edition, 2017, Pearson Education.		
2.	William Stallings, “Data and Computer Communication”, 10th Edition, 2017, Pearson, United Kingdom.		
Mode of Evaluation: CAT, Written Assignment, Quiz, FAT			
Recommended by Board of Studies	04-03-2022		
Approved by Academic Council	No. 65	Date	17-03-2022