Course code	Course Title			L	T	P	C
BITE305L	**Computer Networks**			3	0	0	3
Pre-requisite	**BITE203L**			Syllabus version			
				1.0			

Course Objectives:

1. To develop an understanding the principles of computer networks.
2. To familiarize with OSI model and the functions of layered structure.
3. To explain networking protocols, algorithms and design perspectives.

Course Outcomes:

1. Demonstrate the knowledge of fundamental concepts related to data communication and networks.
2. Describe computer transmission media and signaling mechanisms.
3. Identify and analyze data link layer error, flow control and MAC issues.
4. Develop multiple options for host to network addressing, managing sub networks and internetworking.
5. Evaluate communication services and transport protocols.

Module:1	Networking Principle 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", 2017, 5th Edition, McGraw-Hill, 5th Edition.
Reference Books	
1.	Andrew S Tanenbaum and David J. Wetherall, "Computer Networks", 2021, 6th Edition, Pearson Publisher, 2021.
2.	William Stallings, "Data and Computer Communication", 10th Edition, 2017, Pearson, United Kingdom.
Mode of Evaluation: Continuous Assessment Tests, Assignment, Quiz, Final Assessment Test	

Recommended by Board of Studies	20-05-2022		
Approved by Academic Council	No. 66	Date	16-06-2022