Course Type	Course Code	Name of Course	L	Т	Р	Credit
DC	CSC305	Computer Networks	3	0	0	9

Course Objective					
This syllabus is designed in such a manner that it will provide the basic and fundamental knowledge on Computer					
Networks. The proposed syllabus is designed to cover Computer Networks in detail to provide better research and					
industry oriented understanding for UG students.					
Learning Outcomes					
On successful completion of this unit students will be able to:					
 Identify the basic concept and understand the state-of-the-art in protocols, architectures and applications of computer networks. 					
• Compare, contrast and analyse networks.					

- Understand how networking research is done.
- Understand how we can apply networking concepts in industry.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Overview of Data Communication and Networking: [OSI Reference Model, TCP/IP Protocol Suite; Network Architecture.]	3	Comprehensive introduction about the course content will be delivered. The student will know about the basic network architecture and overview of the data communication.
2	Physical Layer: [Line Configuration, Physical Topology, Analog & Digital Signalling, Transmission Impairment, Line Coding, Bit Synchronization, Multiplexing, Spread Spectrum, Switching, Transmission Medium, Performance Analysis of a Network.]	9	The student will learn about the various topology of the network and actual process of data communication through those. The clear understanding of flow of different types of signal across the network will be provided.
3	Data Link Layer (Logical Link Control): [Framing, Flow Control, Error Control (Noiseless and Noisy Channels Protocols), Error Detection, Error Correction, Protocols: HDLC, PPP.]	7	To understand the process of node-to- node delivery of frames will be conveyed along with monitoring the flow and error between two communicating nodes. Different types of errors along with their detection and correction mechanism will be discussed.
4	Data Link Layer (Medium Access Control): [Physical Addressing, Collision-based Protocols (Pure/slotted ALOHA, CSMA/CD, CSMA/CA), Collision-Free Protocols (Bit-Map, Polling, Token Passing, Binary Count Down etc.), Channelization (TDMA, FDMA, CDMA), IEEE Project 802 (802.3, 802.4, 802.5 etc.).]	6	Addressing methods to be used for the devices will be discussed here. The student will also understand the various methods of sharing the common transmission media, with and without collision.
5	Network Layer: [Packet Switching, Routing (Intra-Domain: Distance Vector, Link State; Inter-domain: Path Vector), Understanding Routing Table and Module, Congestion Control (Close Loop and Open Loop), Protocols: IPv4, Introduction to IPv6, ICMP, Address Mapping (ARP, RARP, BOOTP and DHCP).]	9	This unit will help students to understand some popular routing methods along with function of IPv4. In addition, they will learn the important address mapping techniques.
6	Transport Layer: [Service Addressing, Multiplexing, Types of Services, Client-Server Model, Socket Interface, Protocols: UDP, TCP.]	4	The students learn the TCP and UDP protocols of the Transport layer. In addition, they will learn about the client- server model along with their socket interfaces.

7	Application Layer: [DNS, Electronic Mail (SMTP, POP, IMAP), Introduction to WWW and HTTP, FTP, Remote Logging.]	4	To understand basic properties of application layer and to get an overview of different application layer protocols and techniques.
Total		42	

Text Books:

- B. Forouzan, "Data Communication and Network", McGraw-Hill Publications, 6th edition.
 A. S. Tanenbaum, "Computer Networks", Pearson Education Asia, 5th edition.

References:

- B. Forouzan, "TCP/IP Protocol Suite", Tata McGraw-Hill Publications, 4th edition.
 W. Stalling, "Data and Computer Communication", PHI (EEE). 9th edition.

Peterson et al., "Computer Networks – A Systems Approach", Morgan Kaufmann Publishers, 6th edition.