

Branch Name	Information and Communication technology
Semester/Year	VI/ Third Year
Subject Title	Computer Networks
Subject Code	1ET1070602
Pre-requisite Subject	-

Course Objective: Understand the fundamental concepts of computer network. Students gain knowledge of the how to connect two or more networking devices and how transfer the data. Understand the division of network layers and functionalities of OSI and TCP/IP model. With help of TCP/IP model, students expose the functionality at each layer using various protocols. Students also gain knowledge of network hardware. Analyse and understand the topological and routing strategies for an IP based networking infrastructure.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	2	5	70	30	30	20	150

Subject Contents				
Sr. No	Topic	Total Hours	Weight (%)	
1	Fundamental concepts of computer networks Network, Internet and Intranet, Computer Network Applications, Bandwidth, Guided and unguided transmission media. Transmission modes: Simplex, Duplex, Full duplex, Packet and circuit Switching, Physical Topology, Classification of computer network: LAN, MAN, WAN, Network Models: OSI and TCP/IP	6	20	
2	Application layer World Wide Web: Architectural overview, Hyper Text Transfer Protocol, Concept of cookies, proxy server, File transfer protocol, Simple Mail Transfer Protocol, Domain Name Server	8	16	
3	The Transport Layer The transport service, the transport protocol: User datagram protocol (UDP), and Transmission control protocol (TCP), Congestion control	8	20	
4	Network Layer Introduction to Network layer, Logical Addressing, IP: IPv4 and IPv6, Routing algorithms, Routing Protocols: RIP, OSPF, BGP	12	20	
5	The Data Link Layer The Data Link Layer services: Framing, Error control, Flow control, Error detection and correction, Elementary data link protocols: Simplex, stop and wait, Sliding window protocol, HDLC. The Medium Access Control Sub-layer The channel allocation problem, Multiple Access protocols: ALOHA, CSMA, Collision Free Protocols, Limited Contention Protocols, Ethernet: Traditional Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet, IEEE 802.2, Data link layer switching: Bridges, Local Internetworking, Spanning tree bridges, Remote Bridge, Repeaters, Hub, Switches, Routers, Gateway	12	24	

Course Outcome:

At the end of this course, the student would be able

- To understand the basic terminology used in computer network for data transmission.
- To understand and fundamental knowledge on the OSI and TCP/IP model
- To identify the networking devices and transmission media.
- To have a detail about layering approach and functionality with protocols for efficient communication.
- To explore, analyze and specify the topological and routing strategies for an IP based networking infrastructure.

List of References:

1. Computer network, Andrew S. Tanenbaum, Pearson.
2. Introduction to data communication and networking, Behrouz Forouzan, TMH
3. Data and computer communication, William Stallings, Pearson
4. Computer Networking- A Top-Down approach, Kurose and Ross, Pearson
5. Computer Networks- A Top-Down approach, Behrouz Forouzan, McGraw Hill

e-Resources

<http://williamstallings.com/DataComm/>
<http://www.cs.vu.nl/~ast/>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. To study transmission media.
2. To study networking devices.
3. Demonstrate configure of networking OS, NIC, Cable etc.
4. To study and test the networking commands.
5. Demonstrate connection of two networking machine (Peer to Peer communication)
6. Demonstrate connection of more than two networking machine.
7. To study client-server architecture.
8. Demonstrate the configuration of the FTP.
9. To study WWW structure and Web Browser
10. Demonstrate configuration of the Web server.
11. To discover and use any one networking tool for network traffic.