23CS31T2 - COMPUTER NETWORKS & INTERNET PROTOCOLS

Course Category:	Professional core	**Credits:**	3
Course Type:	Theory	**Lecture-Tutorial-Practical:**	3-0-0
Prerequisite:	• Knowledge in Computer Networks & Internet Protocols	**Sessional Evaluation:** **Univ. Exam Evaluation:** **Total Marks:**	30 70 100
Course Objectives:	**Students undergoing this course are expected:**		
	• Understand the basic concepts of Computer Networks. • Introduce the layered approach for design of computer networks • Expose the network protocols used in Internet environment • Explain the format of headers of IP, TCP and UDP Familiarize with the applications of Internet • Elucidate the design issues for a computer network		

Course Outcomes:	**Upon successful completion of the course, the students will be able to:**	
	CO1	Identify the software and hardware components of a computer network.
	CO2	Design software for a computer network.
	CO3	Develop new routing, and congestion control algorithms.
	CO4	Assess critically the existing routing protocols
	CO5	Explain the functionality of each layer of a computer network
	CO6	Choose the appropriate transport protocol based on the application requirements
Course Content:	**UNIT-I** **Computer Networks and the Internet:** What Is the Internet? The Network Edge, The Network Core, Delay, Loss, and Throughput in Packet Switched Networks(Textbook 2), Reference Models, Example Networks, Guided Transmission Media, Wireless Transmission (Textbook 1). **UNIT-II** **The Data Link Layer, Access Networks, and LANs**: Data Link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols (Textbook 1). Introduction to the Link Layer, Error-Detection and -Correction Techniques, Multiple Access Links and Protocols, Switched Local Area Networks Link **Virtualization:** A Network as a Link Layer, Data Center Networking, **Retrospective:** A Day in the Life of a Web Page (Packet) (Textbook 2) **UNIT-III** **The Network Layer**: Routing Algorithms, Internetworking, The Network Layer in The Internet (Textbook 1)	

	UNIT-IV **The Transport Layer**: Connectionless Transport: UDP (Textbook 2), **The Internet Transport Protocols:** TCP, Congestion Control (Textbook 1) . **UNIT-V** **The Application Layer**: Principles of Network Applications, The Web and HTTP, Electronic Mail in the Internet, DNS—The Internet's Directory Service, Peer-to-Peer Applications, Video Streaming and Content Distribution Networks (Textbook 2). .
Text Books & References Books:	**TEXTBOOKS:** 1. Andrew S.Tanenbaum, David j.wetherall, Computer Networks, 6th Edition, PEARSON. 2. James F. Kurose, Keith W. Ross, ―Computer Networking: A Top-Down Approach‖, 6th edition, Pearson, 2019 **REFERENCE BOOKS:** 1. Forouzan, Datacommunications and Networking, 5th Edition, McGraw Hill Publication. 2. Youlu Zheng, Shakil Akthar, ―Networks for Computer Scientists and Engineers‖, Oxford Publishers, 2016.
E-Resources:	1. https://nptel.ac.in/courses/106105183/25 2. http://www.nptelvideos.in/2012/11/computer-networks.html 3. https://nptel.ac.in/courses/106105183/3