

COMPUTER NETWORKS

VIII Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AIT003	Foundation	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			

COURSE OBJECTIVES:

Students will try to learn:

- The layers of computer network architecture of TCP/IP and OSI model with their applications.
- The performance and characteristics of basic protocols involved in wired/wireless communication process.
- Network performance parameters and traffic issues for Quality of Service (QoS) in wired and wireless communication.

COURSE OUTCOMES:

Upon the successful completion of this course, students will be able to:

- Demonstrate** the network standards and transmission media to the connection of computers, media, switching and devices.
- Describe** the functions of each layer in OSI and TCP/IP model use to communicate over a network for network communications.
- Make use of** all various Techniques of Data-link layer for implementation of point-to-point flow and error control mechanism.
- Explain** the data communication link considering elementary concepts of data link layer protocols for DLC services and access control.
- Identify** the various network layer techniques for designing subnets and supernets and analyse packet flow on basis of routing algorithms.
- Solve** the congestion control mechanism to improve quality of service of networking application
- Discuss** Internetworking principles and Internet protocols (IP, IPv6 and OSPF) for connecting computers to form a computer network
- Demonstrate** the transport layer protocols for reliable communications using end-to-end solution.
- Make use of** common transport layer metrics used to measure network performance include latency, bandwidth, and throughput
- Illustrate** the client-server programming model for the users can access the information stored on a web server on the Internet
- Explain** the various application layer protocols (HTTP, SMTP, FTP and DNS) used to communicate with servers and other applications.
- Develop** advanced computer network architectures for emerging research challenges in the field of communication networks.

UNIT-I	INTRODUCTION TO PHYSICAL LAYER	Classes: 10
Introduction: Networks, network types, internet history, standards and administration; Network models: Protocol layering, TCP/IP protocol suite, the OSI model Transmission media: Introduction, guided media, unguided media; Switching: Introduction, circuit switched networks, packet switching.		

UNIT-II	INTRODUCTION TO DATA LINK LAYER	Classes: 10
Introduction: Link layer addressing; Error detection and correction: Cyclic codes, checksum, forward error correction; Data link control: DLC services, data link layer protocols, media access control: Random access, virtual LAN.		
UNIT-III	THE NETWORK LAYER	Classes: 09
Network layer design issues, routing algorithms, congestion control algorithms, quality of service, and internetworking.		
The network layer in the internet: IPv4 addresses, IPv6, internet control protocols, OSPF(Open Shortest Path First), IP (Internet Protocol)		
UNIT-IV	THE TRANSPORT LAYER	Classes: 08
The transport service, elements of transport protocols, congestion control; The internet transport protocols: UDP (User Datagram Protocol), TCP (Transport Control Protocol), performance problems in computer networks, network performance measurement.		
UNIT-V	INTRODUCTION TO APPLICATION LAYER	Classes: 08
Introduction, client server programming, WWW (World Wide Web) and HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol), E-mail, telnet, DNS (Domain Naming System), SNMP (Simple Network Management Protocol).		
Text Books:		
1. Behrouz A. Forouzan, -Data Communications and Networking, TataMcGraw-Hill, 5 th Edition, 2012. 2. Andrew S. Tanenbaum, David.j. Wetherall, —Computer Networks, Prentice-Hall, 5 th Edition, 2010.		
Reference Books:		
1. Douglas E. Comer, -Internetworking with TCP/IP –Prentice-Hall, 5 th Edition, 2011. 2. Peterson, Davie, Elsevier, -Computer Networks, 5 th Edition, 2011 3. Comer, —Computer Networks and Internets with Internet Applications, 4 th Edition, 2004. 4. Chwan-Hwa Wu, Irwin, —Introduction to Computer Networks and Cyber Security, CRC publications, 2014.		
Web References:		
1. http://computer.howstuffworks.com/computer-networking-channel.htm 2. https://www.geeksforgeeks.org/layers-osi-model/ 3. https://www.wikilectures.eu/w/Computer_Network 4. https://technet.microsoft.com/en-us/network/default.aspx		
E-Text Books:		
1. http://www.freebookcentre.net/networking-books-download/Lecture-Notes-on-Computer-Networks.html 2. http://www.freebookcentre.net/networking-books-download/Introduction-to-Computer-Networks.html		
MOOC Course		
1. https://www.mooc-list.com/course/networking-introduction-computer-networking-stanford-university 2. https://lagunita.stanford.edu/courses/Engineering/Networking/Winter2014/about .		