Kadi Sarva Vishwavidyalaya

Faculty of Engineering & Technology

Third Year Bachelor of Engineering (Computer Engineering)

(In Effect From Academic Year 2019-20)

Subject Code: CE505-N	**Subject Title:** Computer Networks
Pre-requisite	

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

Course Objective: This course aims

- To understand the basics of Networks, its significance and its usage.
- To understand the services being offered at each layer of network protocol stack.
- To have understanding of different network protocols, network metrics and different applications of Internet.

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Overview of Networks and Data Communications	9
2	Physical layer	8
3	Data Link layer	8
4	Medium Access control sub layer	12
5	Network layer	16
6	Transport layer	8
7	Application layer	3

Totalhours (Theory):64
Totalhours(Lab):32
Totalhours:96

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Detailed Syllabus

No	Topic	Lecture (Hrs)	Weightage (%)
1	**Overview of Networks and Data communication** Introduction to Data Communications, Computer Networking, Protocols and Standards; Types of Network, Network Topology, Protocol hierarchies, and Design issues of layers, Interfaces and services; Reference Model: The OSI reference model, TCP/IP reference model, Comparison between OSI model and TCP/IP model; Network standards and policies, Uses of computer network, Network hardware, Network software.	9	14
2	**Physical Layer** Data and transmission techniques, Multiplexing, Transmission media, Asynchronous Communication, Wireless transmission, ISDN, ATM, Cellular Radio, Switching techniques issues	8	13
3	**Data link Layer** Data Link layer Design Issues, Link layer services, Framing, error control and Flow control, DLL protocols: Elementary Data Link Protocols, Sliding Window protocols: Protocols Verification models	8	13
4	**Medium Access Control Sub layer** The channel allocation problem, Multiple Access protocols: ALOHA, CSMA, Collision free protocols, Limited contention protocols, Wavelength Division Multiple Access Protocols; Wireless LAN protocols; Ethernet: Traditional Ethernet ,Types of Ethernet , IEEE 802.2: LLC Data link layer switching Ethernet(CSMA/CD); Token Ring, DQDB, FDDI, Bridges and recent developments.	12	18
5	**Network Layer** Design Issues, Connection Oriented and Connectionless networks, Interconnecting Devices, IP Protocol and Subnetting ,Routing Algorithms: Shortest Path Routing: RIP, OSPF; Flooding, Distance Vector Routing, Link State Routing, Broadcast, multicast, anycast routing; Congestion Control and its Algorithms, Quality of Service, Internetworking, Addressing, N/W Layer Protocols: IPv4 and IPv6and recent developments.	16	24
6	**Transport Layer** The transport layer protocols and its services, Transport service primitives: Connection establishment, Connection release; Flow control: Multiplexing and Demultiplexing; TCP, UDP, Congestion control, QOS and its improvement.	8	13
7	**Application layer** The Domain Name System, DHCP, Electronic Mail, World Wide Web, Content delivery, Principles of Network applications, HTTP, Client Server Model and recent development.	3	5
	Total	64	100

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Instructional Method and Pedagogy:

- At the start of course, significance of the course, content delivery pattern, and other required details regarding subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which will be reflected in Continuous Internal Assessment (CIA) component in the examination scheme of the course.
- Assignments based on the course content will be given to the students and will be evaluated at regular interval evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Experiments shall be performed in the laboratory related to course contents.

Learning Outcome:

On successful completion of this course, the student should be able to:

- Understand the gravity and concepts of computer networks.
- Conceptualize and appreciate the layered model for computer networking.
- Identify basic protocols and design issues for layered model.
- Explain various topological and routing strategies for IP based networks.

E-Resources:

1. http://vlssit.iitkgp.ernet.in/ant/ant/
2. https://www.netacad.com/about-networking-academy/packet-tracer/
3. http://www.networkworld.com/blogs
4. https://www.tutorialspoint.com/ipv6/

Reference Books:

1. Computer networks, Andrew S. Tanenbaum, Pearson.
2. Introduction to Data communication and Networking, Behrouz Forouzan, TMH Publication.
3. Data and computer communication, William Stallings, Pearson
4. TCP/IP Protocol suit ,Behrouz Forouzan, TMH Publication
5. Computer Network, Natalia Olifer, Victor Olifer, Wiley-India edition.

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List of experiments:

No	Name of Experiment
1	Study of different Network devices.
2	Study of various networking commands.
3	Introduction to Cisco packet tracer and perform IP exercises, sharing and map network drive.
4	To perform static routing using packet tracer.
5	Introduction to Network address translation.
6	Create a network having 4 subnets. Each workstation is having ip address of class B.
7	To perform routing using RIP in packet tracer.
8	To perform routing using IGRP packet tracer.
9	To perform routing using OSPF packet tracer.
10	To configure DHCP server in packet tracer.
11	To configure DNS in packet tracer.