



**Kadi Sarva Vishwavidyalaya**  
**Faculty of Engineering & Technology**  
**Third Year Bachelor of Engineering (Computer Engineering)**  
(In Effect From Academic Year 2019-20)

<b>Subject Code:</b> CE505-N	<b>Subject Title:</b> Computer Networks
<b>Pre-requisite</b>	

### 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	<b>Overview of Networks and Data communication</b> 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	<b>Physical Layer</b> Data and transmission techniques, Multiplexing, Transmission media, Asynchronous Communication, Wireless transmission, ISDN, ATM, Cellular Radio, Switching techniques issues	8	13
3	<b>Data link Layer</b> 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	<b>Medium Access Control Sub layer</b> 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	<b>Network Layer</b> 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	<b>Transport Layer</b> 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	<b>Application layer</b> 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
	<b>Total</b>	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.