



SARVAJANIK UNIVERSITY
SarvajaniK College of Engineering and
Technology
Bachelor of Technology



Year: B. Tech II (Semester IV)

Subject Name: Computer Networks

Subject Code: BTCO13401

Type of course: Profession Core Course

Prerequisite: Working experience of any one programming language

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests) CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Contents:

Sr. No.	Contents	Total Hours
1.	Introduction To Networks Data Communication, Components of Data Communication, Types of Data flow, Network criteria, Network Topologies, Categories of Network, Physical Media, Packet Switching, Circuit Switching, Overview of delay in packet switched networks, Queuing Delay and Packet Loss, End-to-End Delay, Throughput, OSI Reference Model, TCP-IP Model	07
2.	Data Link Layer Introduction to link layer services, Error-detection and correction techniques, Multiple access protocols, Addressing - ARP, RARP, Ethernet, VLAN	10
3.	Network Layer Forwarding and routing, Network Service models, Virtual and Datagram networks, Datagram format, IP protocol and addressing in the Internet (Logical addressing - IPv4 and IPv6), subnetting, supernetting Routing algorithms: Link State, Distance Vector and Hierarchical Routing, BGP, RIP, OSPF, Broadcast and Multicast routing	11



57



SARVAJANIK UNIVERSITY
SarvajaniK College of Engineering and
Technology
Bachelor of Technology



4.	Transport Layer Introduction and transport layer services, Multiplexing and Demultiplexing, Connectionless transport (UDP), Principles of reliable data transfer, Connection-oriented transport (TCP), Congestion control, TCP congestion control	10
5.	Application Layer WEB and HTTP, File Transfer Protocol (FTP), Electronic Mail in the Internet (SMTP), Domain Name Space (DNS), SNMP, Socket Programming: Creating Network Applications	07

Suggested Specification table with Marks (Theory): (For B. Tech only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
12	24	12	6	6	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr No	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Computer Networking- A Top-Down approach	Kurose and Ross	Pearson	2013	6 th Edition
2	Computer Networks	Andrew Tanenbaum	Prentice Hall	2011	5 th Edition
3	Data Communications and Networking	Behrouz Forouzan	McGraw Hill	2007	4 th Edition

Course Outcomes (CO):

Sr. No.	CO statements	Marks % weightage





SARVAJANIK UNIVERSITY
SarvajaniK College of Engineering and
Technology
Bachelor of Technology



CO-1	Understand the concepts of OSI and TCP/IP reference model	15
CO-2	Understand the methodology and various protocols for multiple access in context of wired and wireless networks	25
CO-3	Practice and analyze the topological and routing strategies for an IP based networking infrastructure	25
CO-4	Compare different kind of routing protocols and discuss various congestion control algorithm in context of wired and wireless networks Practice various types of error detection and correction techniques	20
CO-5	Explain various protocols working on the application layer.	15

List of Open learning website:

1. <http://swayam.gov.in/>
2. <https://www.netacad.com/courses/packet-tracer>

List of Open-Source Software: --

1. Cisco Packet Tracer
2. Wireshark

List of Experiments:

Sr.No	Practical
1.	Study of various network devices. 1. Repeater 2. Hub 3. Bridge 4. Switch 5. Router 6. Modem
2.	Study of basic network command and network configuration commands. 1. Ping 2. ipconfig 3. Hostname 4. getmac 5. arp 6. NSlookup 7. nbtstat 8. net 9. netstat 10. taskkill 11. tracert 12. route
3.	Implement Hamming Code to detect and correct errors.
4.	Implement Cyclic Redundancy Check Method (using CRC Generator and Checker) to detect error in the communication.



5.	Implement different LAN topologies using Network Simulator.
6.	Implement the concept of VLAN using Network Simulator.
7.	Write a program to implement distance vector routing.
8.	Write a program to implement a static routing algorithm. (Dijkstra's Algorithm)
9.	Implement the Chatting Application using socket programming.
10.	Network packet capture and header analysis using Wireshark (TCP, UDP, IP).
11.	Analysis of Ethernet and ARP using Wireshark.
12.	Analysing HTTP using Wireshark 1. The Basic HTTP GET/response interaction 2. The HTTP CONDITIONAL GET/response interaction
13.	Setup DHCP client and Server in local LAN.