DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Re-Accredited by NAAC with 'A' Grade
Accredited by NBA for AERO, BME, CSE, ECE, EEE, IT & MECH.
PERAMBALUR-621212, TAMILNADU, INDIA.
Website: www.dsengg.ac.in

LABORATORY COURSE PLAN
2024-2025

LAB COURSE TITLE	COMPUTER NETWORKS LABORATORY			
LAB COURSE CODE	U23ITP42			
LAB COURSE STRUCTURE	LECTURE	TUTORIAL	PRACTICAL	CREDIT
	0	0	4	2
REGULATION	BRANCH	YEAR	SEMESTER	ACADEMIC YEAR
2023	IT	II	IV	2024-2025
COURSE INCHARGE				

SYLLABUS

COURSE OBJECTIVE:

The student should be made to:

- To learn and use network commands.
- To learn socket programming.
- To implement and analyze various network protocols.
- To learn and use simulation tools.
- To use simulation tools to analyze the performance of various network protocols.

LIST OF EXPERIMENTS

1. Learn to use commands like tcpdump, netstat, ifconfig, nslookup and trace route.
2. Capture ping and trace route PDUs using a network protocol analyzer and examine.
3. HTTP web client program to download a web page using TCP sockets.
4. Applications using TCP sockets: like
   - Echo client and echo server
   - Chat
   - File Transfer
5. Simulation of DNS using UDP sockets.
6. Code simulating ARP /RARP protocols.

7. Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.
8. Study of TCP/UDP performance using Simulation tool.
9. Simulation of Distance Vector/ Link State Routing algorithm.
10. Performance evaluation of Routing protocols using Simulation tool.

TOTAL: 60 PERIODS

BIBLIOGRAPHY

TEXT/REFERENCE BOOKS:

1. Herbert Schildt, Java: The Complete Reference, 8/e, Tata McGraw Hill, 2011
2. Y. Daniel Liang, Introduction to Java Programming, 7/e, Pearson, 2013
3. Abraham Silberschatz, Peter B Galvin, Greg Gagne, Operating System Concepts, 9/e, Wiley India, 2015.
4. Computer Networks A Systems Approach-Larry L.Peterson and Bruce S.Davie,4th Edition .Morgan Kaufman

VIRTUAL LAB LINK:

https://www.bits-pilani.ac.in/computer-networks-network-programming-lab/
https://www.nptelvideos.in/2012/11/computer-networks.html
https://iiitbh.ac.in/cn-lab
https://www.tecmint.com/linux-network-configuration-and-troubleshooting-commands

EXP. NO.	NAME OF THE EXPERIMENTS	NO. OF PERIODS	CUMULATIVE PERIODS
CYCLE I			
1	Learn to use commands like tcpdump, netstat, ifconfig, nslookup and trace route.	4	4
2	Capture ping and trace route PDUs using a network protocol analyzer and examine.	4	8
3	HTTP web client program to download a web page using TCP sockets.	4	12
4	Applications using TCP sockets like: • Echo client and echo server • Chat • File Transfer	8	20
5	Simulation of DNS using UDP sockets.	4	24
6	Code simulating ARP /RARP protocols.	4	28
CYCLE II			
7	Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.	8	36
8	Study of TCP/UDP performance using Simulation tool.	8	44

9	Simulation of Distance Vector/ Link State Routing algorithm.	8	52
10	Performance evaluation of Routing protocols using Simulation tool.	8	60

COURSE OUTCOME

At the end of the course, the student should be able to:

CO1: Implement various protocols using TCP and UDP
CO2: Understand the functions of Datalink layer and explain the protocols in this layer.
CO3: Use simulation tools to analyze the performance of various network protocols
CO4: Understand the functions of Transport layer and explain the protocols of this layer.
CO5: Explain the architecture and working principles of different application layer protocols in the context of client-server communication.
CO6: Explain Network simulator (NS) and Simulate Congestion Control Algorithms using NS

CO-PO MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	2	2	-	-	-	-	-	-	-	1	2
CO2	3	1	2	-	2	-	-	-	-	-	-	-	1	1
CO 3	3	2	2	2	1	-	-	-	-	-	-	-	2	2
CO 4	3	2	1	2	1	-	-	-	-	-	-	-	2	2
CO 5	3	1	1	2	2	-	-	-	-	-	-	-	1	2
CO 6	3	1	1	2	2	-	-	-	-	-	-	-	1	2
AVG	3.00	1.57	1.50	2.00	1.66	-	-	-	-	-	-	-	1.33	1.83

ADDITIONAL EXPERIMENTS		
EXP. NO.	**NAME OF THE EXPERIMENTS**	**Identified Resource link**
1	Implementation Of Stop And Wait Protocol And Sliding Window Protocol	http://vlabs.iitkgp.ac.in/ant/
2	Platform required to run network simulator	http://vlabs.iitkgp.ac.in/ant/
3	Implement RSA algorithm using HTML and JavaScript	https://gist.github.com
5	Implementing an IP Addressing Scheme	https://microsoftlearning.github.io AZ-104-MicrosoftAzureAdministrator/Instructions/Labs/

MODEL LAB DETAILS:

BATCH	REGISTER NO.	MODE OF LAB CONDUCT	DATE	TIMING
1	810422205128-810422205311	offline	-	-

Google classroom code: wgnrdhz
Google class name: Computer Networks Laboratory
LIST OF QUESTIONS

1. Write a UDP Minichat Client/Server Application to support multiple simultaneous Chat sessions Using multithreading.
2. Design and study the performance of STAR and Ring topology using simulator.
3. A simple UDP server program that waits for client's requests and then accepts the message (datagram) and the server program can manipulate client's messages/request and send a new message as a response.
4. Examine the throughput performance of sliding window with varying packet sizes, error rates and Round Trip Times.
5. Use simulator to analyses the performance of Routing Information Protocol (RIP), a routing protocol and observe how RIP is affected by link failures.
6. Write a UDP program to multicast messages to more than one other machine at the same time.
7. Write a program for the simulation of Domain Name System.
8. Write a program to get the IP or Doted decimal address of the system using RARP.
9. Write a program to simulate the calculation of traditional checksum.
10. Write a program to simulate the distance-vector algorithm.
11. Write a program to simulate the link-state algorithm.
12. Write a program to simulate the path-vector algorithm.
13. Develop applications using UDP Sockets for DNS.
14. Develop applications using UDP Sockets for SNMP.
15. Develop applications using UDP Sockets for File Transfer.
16. Write and test a program to simulate CDMA.
17. Simulate error correction code (like CRC).
18. Write a program for the simulation of Domain Name System.
19. Write and test a program to simulate the flow diagram of CSMA/CA.
20. Implement and Configure the link state routing topology in VPN.

VIVA QUESTIONS

1. What are functions of different layers?
2. Differentiate between TCP/IP Layers and OSI Layers
3. Why header is required?
4. What is the use of adding header and trailer to frames?
5. What is encapsulation?
6. Why fragmentation requires?
7. What is MTU?
8. Which layer imposes MTU?
9. Differentiate between flow control and congestion control.
10. Differentiate between Point-to-Point Connection and End-to-End connections.
11. What are protocols running in different layers?
12. What is Protocol Stack?
13. Differentiate between TCP and UDP.

14. Differentiate between Connectionless and connection oriented connection.
15. Why frame sorting is required? 16. What is meant by subnet?
17. What is meant by Gateway?
18. What is an IP address?
19. What is MAC address?
20. Why IP address is required when we have MAC address?
21. What is meant by port?
22. What are ephemerical port number and well known port numbers?
23. What is a socket?
24. What are the parameters of socket()?
25. Describe bind(), listen(), accept(),connect(), send() and recv().

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