Savitribai Phule Pune University
Third Year of Artificial Intelligence and Data Science (2019 Course)
317524: CN Laboratory

Teaching Scheme:	Credit	Examination Scheme:
PR: 02 Hours/Week	01	Term Work (TW): 25 Marks Practical(PR): 25 Marks

Prerequisite Courses, if any:

Companion Course, if any: **Computer Network(317522)**

Course Objectives:

1. To learn computer network hardware and software components
2. To learn computer network topologies and types of network
3. To develop an understanding of various protocols, modern technologies and applications
4. To learn modern tools for network traffic analysis
5. To learn network programming

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Analyze the requirements of network types, topology and transmission media
CO2: Demonstrate error control, flow control techniques and protocols and analyze them
CO3: Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms
CO4: Develop Client-Server architectures and prototypes
CO5: Implement web applications and services using application layer protocols

List of Assignments

Group A (Any four assignment)

1. Demonstrate the different types of topologies and types of transmission media by using a packet tracer tool.
2. Setup a wired LAN using Layer 2 Switch. It includes preparation of cable, testing of cable using line tester, configuration machine using IP addresses, testing using PING utility and demonstrating the PING packets captured traces using Wireshark Packet Analyzer Tool.
3. Setup a WAN which contains wired as well as wireless LAN by using a packet tracer tool. Demonstrate transfer of a packet from LAN 1 (wired LAN) to LAN2 (Wireless LAN).
4. Use packet Tracer tool for configuration of 3 router networks using one of the following protocols RIP/OSPF/BGP.
5. Write a program to demonstrate Sub-netting and find subnet masks.
6. Write a program to implement link state /Distance vector routing protocol to find a suitable path for transmission.

Group B (any six)

7. Socket Programming using C/C++/Java.
   a. TCP Client, TCP Server
   b. UDP Client, UDP Serve

8. Write a program using TCP socket for wired network for following
   a. Say Hello to Each other
   b. File transfer

9. Write a program using UDP Sockets to enable file transfer (Script, Text, Audio and Video one file each) between two machines.

10. Capture packets using Wireshark and accomplish the following and save the output in file:
    a. Capture all TCP traffic to/from Facebook, during the time when you log in to your Facebook account
    b. Capture all HTTP traffic to/from Facebook (other website), when you log in to your Facebook account
    c. Write a DISPLAY filter expression to count all TCP packets (captured under item #1) that have the flags SYN, PSH, and RST set. Show the fraction of packets that had each flag set.
    d. Count how many TCP packets you received from / sent to Facebook (other website), and how many of each were also HTTP packets.

11. Study and Analyze the performance of HTTP, HTTPS and FTP protocol using Packet tracer tool.

12. To study the SSL protocol by capturing the packets using Wireshark tool while visiting any SSL secured website (banking, e-commerce etc.).

13. Illustrate the steps for implementation of S/MIME email security, POP3 through Microsoft® Office Outlook.

14. To study the IPsec (ESP and AH) protocol by capturing the packets using Wireshark tool.

Group C (Compulsory)

15. Installing and configuring DHCP server and assign IP addresses to client machines using DHCP server.

16. Write a program for DNS lookup. Given an IP address input, it should return URL and vice versa.

@The CO-PO mapping table

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	2	-	2	1	1	1	-	1	-	1
CO2	-	3	-	1	1	-	-	1	-	-	-	-
CO3	3	2	1	1	-	-	-	1	-	-	1	1
CO4	-	1	2	1	1	1	-	-	-	-	-	1
CO5	2	3	-	-	1	-	-	-	1	-	-	-