8. Implement and simulate algorithm for Distance Vector Routing protocol or Link State Routing protocol.*
9. Implement Simple Mail Transfer Protocol.
10. Implement File Transfer Protocol.*
11. Implement congestion control using a leaky bucket algorithm.*
12. Understanding the Wireshark tool.*
13. Study of NS2 simulator*

Course Outcomes

CO#	Course Outcomes
CO1	Use network related commands and configuration files in Linux Operating System. **(Cognitive Knowledge Level: Understand).**
CO2	Develop network application programs and protocols. **(Cognitive Knowledge Level: Apply)**
CO3	Analyze network traffic using network monitoring tools. **(Cognitive Knowledge Level: Apply)**
CO4	Design and set up a network and configure different network protocols. **(Cognitive Knowledge Level: Apply)**
CO5	Develop simulation of fundamental network concepts using a network simulator. **(Cognitive Knowledge Level: Apply)**

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
co1	✓	✓	✓					✓		✓		✓	
co2	✓	✓	✓	✓				✓		✓		✓	
co3	✓	✓	✓	✓	✓			✓		✓		✓	
co4	✓	✓	✓	✓	✓	✓		✓		✓		✓	
co5	✓	✓	✓	✓	✓			✓		✓		✓	

Abstract POs defined by National Board of Accreditation

po#	Broad PO	po#	Broad PO
po1	Engineering Knowledge	**po7**	Environment and Sustainability
po2	Problem Analysis	**po8**	Ethics
po3	Design/Development of solutions	**po9**	Individual and teamwork
po4	Conduct investigations of complex problems	**po10**	Communication
po5	Modern tool usage	**po11**	Project Management and Finance
po6	The Engineer and Society	**po12**	Lifelong learning

Reference Books:

1. W. Richard Stevens, Bill Fenner, Andy Rudoff, UNIX Network Programming: Volume 1, The Sockets Networking API, 3rd Edition, Pearson, 2015
2. Lisa Bock, Learn Wireshark: Confidently navigate the Wireshark interface and solve real-world networking problems, Packt Publishing, 2019
3. Teerawat Issariyakul, Ekram Hossain, Introduction to Network Simulator NS2,2nd Edition, Springer,2019

Experiment 1

Getting started with Basics of Network configurations files and Networking

Commands in Linux.

The important network configuration files in Linux operating systems are

1. /etc/hosts

This file is used to resolve hostnames on small networks with no DNS server. This text file contains a mapping of an IP address to the corresponding host name in each line. This file also contains a line specifying the IP address of the loopback device i.e, 127.0.0.1 is mapped to localhost.

A typical hosts file is as shown

127.0.0.1 localhost
127.0.1.1 anil-300E4Z-300E5Z-300E7Z

2. /etc/resolv.conf

This configuration file contains the IP addresses of DNS servers and the search domain.
A sample file is shown
DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 127.0.1.1

3. /etc/sysconfig/network

This configuration file specifies routing and host information for all network interfaces. It contains directives that are global specific. For example if NETWORKING=yes, then /etc/init.d/network activates network devices.

4. /etc/nsswitch.conf

This file includes database search entries. The directive specifies which database is to be searched first.