| **Department: Computer Science and Engineering** | |
|---|---|
| **Course Title: Computer Network Laboratory** | **Course Code: CS58L** |
| **Credits (L: T:P): 0:0:1.5** | **Core/Elective: Core** |
| **Type of Course: Practical** | **Total Lecture Hours: 39** |
| **CIE Marks :50** | |

**Pre-requisite:** Data Communication, Computer Networks

**Course Outcomes:**

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

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| CO1 | Analyse and Compare various networking protocols |
| CO2 | Demonstrate the working of different concepts of networking |
| CO3 | Implement, analyse and evaluate networking protocols in NS2 / NS3 and JAVA/Python programming language. |

The Laboratory will consist of simulation experiments and experiments to be implemented using C++/ Java/ Python.

| Unit No. | Programs | No. of Hours |
|---|---|---|
| **PART-A: Implement the following using C++/Java/Python** | | |
| 1 | 1. Write a program for error detecting code using CRC-CCITT (16- bits).<br><br>2. Write a program to find the shortest path between vertices using bellman-ford algorithm.<br><br>3. Using TCP/IP sockets, write a client – server program to make the client send the file name and to make the server send back the contents of the requested file if present. | 08 |
| 2 | 4. Write a program on datagram socket for client/server to display the messages on client side, typed at the server side.<br><br>5. Write a program for simple RSA algorithm to encrypt and decrypt the data.<br><br>6. Write a program for congestion control using leaky bucket algorithm. | 07 |
| **PART-B: Simulation Experiments using NS2/ NS3/ NetSim or any other suitable simulation software** | | |
| 3 | 7. Implement three nodes point – to – point network with duplex links between them. Set the queue size, vary the bandwidth and find the number of packets dropped.<br><br>8. Implement transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion. | 08 |

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|---|---|---|
| 4 | 9. Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.<br><br>10. Implement simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets. | 08 |
| 5 | 11. Implement and study the performance of GSM on NS2/NS3 (Using MAC layer) or equivalent environment.<br><br>12. Implement and study the performance of CDMA on NS2/NS3 (Using stack called Call net) or equivalent environment | 08 |

**Text Books:**


1. Andrew S Tanenbaum, David J. Wetherall, "Computer Networks", 5th Edition, PHI/Pearson Publication, 2011


**Reference Books:**


1. Alberto Leon-Garcia and Indra Widjaja: Communication Networks –Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.
2. William Stallings, Data and Computer Communication, 8th edition, PHI, 2007
3. Behrouz A Forouzan, Data Communications and Networking, Tata McGraw Hill, 5th edition, 2012.


**Web Links:**

1. https://nptel.ac.in/courses/106/105/106105081/
2. https://onlinecourses.swayam2.ac.in/cec19_cs07/preview
3. https://www.isi.edu/nsnam/ns/
4. https://www.nsnam.org/