Computer Networks Laboratory
(Lab)

Course Code	15CSL77	**Credits**	2
Course type	Lab	**CIE Marks**	25 marks
Hours/week: L-T-P	0 – 0 – 3	**SEE Marks**	25 marks
Total Hours:	36	**SEE Duration**	3 Hours for 50 marks

	Course learning objectives
1	Understand the design and simulation of wired and wireless networks with different traffics.
2	Know the analysis of wired and wireless networks with respect to different performance analysis parameters.
3	Realize error detection, routing, message passing and traffic shaping algorithms

Pre-requisites: Basic UNIX Commands, Data Structures and Computer Networks.

PART A

The following experiments shall be conducted using either NS2 OR any suitable simulator

1. Simulate a 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.
2. Simulate a four node point-to-point network, and connect the links as follows: n0-n2, n1-n2 and n2-n3. Apply TCP traffic between n0-n3 and UDP traffic between n1-n3. Apply relevant applications over TCP and UDP agents changing the parameter and determine the number of packets by TCP/UDP.
3. Simulate the transmission of ping messaged over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.
4. Simulate a Wireless Sensor Network using N-nodes (6-10), change error rate and data rate and compare the throughput.
5. Simulate simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets.

PART B

The following experiments shall be conducted using C/JAVA

6. Write a program for error detecting code using CRC-CCITT (16-bits).
7. Write a program for distance vector algorithm to find suitable path for transmission.
8. Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.
09. Write a program for simple RSA algorithm to encrypt and decrypt the data.
10. Write a program for congestion control using Leaky bucket algorithm.

Course Outcome (COs)

At the end of the course, the student will be able to		**Bloom's Level**
1.	Design and simulate wired and wireless networks with different traffics.	**L4**
2.	Demonstrate the analysis of wired and wireless networks with respect to different performance analysis parameters.	**L4**
3.	Implement error detection, routing, message passing and traffic shaping algorithms	**L3**

Program Outcome of this course (POs)	PO No.
1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	1
2. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	2
3. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	12

Text Books:

1. BehrouzForouzon-Data Communications and Networking, McGraw Hill Edition, 4th Edition, 2006 and onwards.
2. Nader F Mir-Computer and Communication Networks, Pearson Publication, 2009 and onwards.
3. Larry Peterson and Bruce Davie- Computer Networks- A Systems Approach, Elsevier, 5th Edition, 2012 and onwards.

Reference Books:

1. Alberto Leon Garcia & Indra Widjaja - Communication Networks – Fundamental Concepts & key architectures, Tata McGraw Hill, 2nd Edition, 2004 and onwards.

Assessment methods	
1.	IA Test
2.	Viva-Voce
3	Lab Journal Evaluation.

Scheme of Continuous Internal Evaluation (CIE):

Components	Conduct of the lab	Journal submission	Total Marks
Maximum Marks: 25	10	15	25
➢ Submission and certification of lab journal is compulsory to qualify for SEE. ➢ **Minimum marks required to qualify for SEE : 13 marks out of 25**			

Scheme of Semester End Examination (SEE):

1.	It will be conducted for 50 marks of 3 hours duration**. It will be reduced to 25 marks for the calculation of SGPA and CGPA.**		
2.	**Minimum marks required in SEE to pass:20**		
	Initial write up	10 marks	50 marks
	Conduct of experiments	20 marks	
	Viva- voce	20 marks	
3.	Student is required to solve one problem from PART-A and one problem from PART-B. The questions are allotted based on lots. Both Questions carry equal marks. .		