

**Computer Networks Laboratory  
(Lab)**

<b>Course Code</b>	16CSL57	<b>Credits</b>	2
<b>Course type</b>	Lab	<b>CIE Marks</b>	25 marks
<b>Hours/week: L-T-P</b>	0 – 0 – 3	<b>SEE Marks</b>	25 marks
<b>Total Hours:</b>	36	<b>SEE Duration</b>	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 message 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

1. Design and simulate wired and wireless networks with different traffics.
2. Demonstrate the analysis of wired and wireless networks with respect to different performance analysis parameters.  
Implement error detection, routing, message passing and traffic shaping algorithms
3. algorithms

**Bloom's  
Level**

**L4**

**L4**

**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:

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

#### Reference Books:

- Alberto Leon Garcia & Indra Widjaja - Communication Networks – Fundamental Concepts & key architectures, Tata McGraw Hill, 2<sup>nd</sup> 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. ➤ <b>Minimum marks required to qualify for SEE : 13 marks out of 25</b>			

#### Scheme of Semester End Examination (SEE):

1.	It will be conducted for 50 marks of 3 hours duration. <b>It will be reduced to 25 marks for the calculation of SGPA and CGPA.</b>		
2.	<b>Minimum marks required in SEE to pass:20</b>		
	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. .		