

NAWAB SHAH ALAM KHAN COLLEGE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LABORATORY IMPROVEMENT FOR FUTURE TRENDS (LIFT) - - -I

NAME OF THE LABORATORIES

S.No.	YEAR-SEM	NAME OF THE LAB
1.	IV B.TECH-ISEM	LINUX PROGRAMMING

A Guide for execution of Lab Courses

VISION OF THE INSTITUTE:

- To impart quality technical education with strong ethics, producing technically sound engineers capable of serving the society and the nation in a responsible manner.

MISSION OF THE INSTITUTE:

- M1: To provide adequate knowledge encompassing strong technical concepts and soft skills thereby inculcating sound ethics.
- M2: To provide a conducive environment to nurture creativity in teaching- learning process.
- M3: To identify and provide facilities which create opportunities for deserving students of all communities to excel in their chosen fields.
- M4: To strive and contribute to the needs of the society and the nation by applying advanced engineering and technical concepts

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION:

To produce quality IT professionals, with an ability to adapt to ever changing IT needs of local, national and international arena, through effective teaching & learning, interactions with alumni and industry

MISSION:

- M1: To provide a holistic learning environment for students through ethical practices.
- M2: To provide quality infrastructure through practical exposure to the latest technology requirements.
- M3: To train the students in soft skills to excel in placements and competitive exams at higher level the industry ready.
- M4: To have a healthy Industry - Institute interaction through faculty development programs, student internships, guest lectures and using latest teaching learning methodologies.
- M5: To provide effective platform to meet the industrial requirement and provide research-oriented environment for the faculty to meet the continuous societal needs.

PROGRAM SPECIFIC OUTCOMES (PSO's)

- Develop efficient information management systems using latest development tools catering to the globally changing requirements in multi-disciplinary domains
- Manage real time IT projects with consideration of human, financial, ethical and environmental factors and an understanding of policy implications.

1. AIM OF THE LIFT:

The main aim of the LIFT programme is to innovate, modify the existing facilities in labs, to create awareness among the students and develop Industry –Institution interactions and reach the standards in laboratories

2. FUNCTIONS OF THE LIFT:

- I. To create better understanding concepts of LIFT and other lab related activities among the staff and lab technicians for better improvement.
- II. To Arrange LIFT Presentations from each department about the lab activities by the staff handling the labs. (Lab Planners)
- III. To Prepare GAP ANALYSIS: This involves collection of requirements from each lab of every department, information about expansion of labs, repairs and maintenance of labs etc.
- IV. To arrange Industrial Visits/ Industrial training programs in coordination with concerned lab staff and Heads of the departments.
- V. A Report on Shadow Engineering: This involves arrangement of Industrial and Practical learning, Submission of Industrial Visit report, Technical Survey reports and Market Survey of a product for development in laboratories.
- VI. Verification of all the laboratories in every department by the LIFT Team along with the Principal and the concerned HODs, to check whether the activities are going according to LIFT guidelines, to check the Record Keeping, Lab Manuals and Viva sessions etc.
- VII. Check for LEAD Experiments and its follow up.
- VIII. Submission of proposals related to R&D, Project and Consultancy from lab staff to the Principal for further approvals.

LAB IMPROVEMENT FOR FUTURE TRENDS PROGRAMME (LIFT)

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1. OBJECTIVES AND RELEVANCE:

The main objective of the LIFT concept in lab course is to provide practical hands on experience for each student by providing them with good exposure to different experiments and to uplift the knowledge levels of the student, with different applications in various fields.

2. SCOPE:

The main scope of the LIFT lab course is to cover all the experiments as per the schedule given in the prescribed week wise periods. With this, a student can better understand the concepts and operating systems so that he could get better knowledge about each lab.

3. PREREQUISITES:

The basic level idea related to each experiment should be provided to the students before conducting main lab course. Following details are to be explained related to experiment:

1. Introduction to experiment – 30 min
2. The Operating of the equipment/instrument/software
3. Record of Experimental Results.
4. Sample Calculations / Executable Programs

4. SYLLABUS AS PER JNTUH:

The lab course should be planned as per the JNTUH syllabus. In this, LEAD experiments should also be included in the cycle of experiments.

5. (A) LAB SCHEDULE:

The lab schedule should be planned once in a week. The week wise scheduled experiment should be completed.

Batches	week-1	week-2	week-3	week-4	week-5	week-6
B1	Demo	Exp.1	Exp.2	Exp.10	Exp.9	Exp.8
B2	Demo	Exp.2	Exp.10	Exp.9	Exp.8	Exp.1
B3	Demo	Exp.10	Exp.9	Exp.8	Exp.1	Exp.2
B4	Demo	Exp.9	Exp.8	Exp.1	Exp.2	Exp.10
B5	Demo	Exp.8	Exp.1	Exp.2	Exp.10	Exp.9

(B) Scheme of Evaluation:

The scheme of evaluation for internal and external exams as follows:

<u>LAB INTERNAL:</u>							
Day to Day Evaluation-15					Internal Exam-10		
Uniform	Observation & Record	Performance Of the Experiment	Result	Viva	Write up	Execution & Results	Viva
Marks-3	Marks-3	Marks-3	Marks-3	Marks-3	Marks-4	Marks-3	Marks-3
Total Marks-25							

<u>LAB EXTERNAL:</u>			
S.NO	Write up	Final Evaluation	Viva
1	1. Aim 2. Procedure 3. Program 4. Expected output.	Based on correctness of the program and Results	Based on understanding of Experiment and theoretical questions in the related subjects
Marks	20	20	10
Total Marks-50			

6. SUGGESTED BOOKS:

The suggested books should be recommended to the students as per the JNTUH syllabus prescribed.

7. WEBSITES (USEFUL LINKS):

The useful links should be provided to the students, where they can get an easy access to the knowledge of the experiment.

LINUX PROGRAMMING LAB

CONTENTS:

- 1. OBJECTIVES AND RELEVANCE**
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- 7. WEBSITES (USEFUL LINKS)**

1. OBJECTIVES AND RELEVANCE

The main objective of the lab course is to gain practical knowledge of Linux utilities (Commands), shell script and client server communication using sockets and multithread programming.

2. SCOPE

The main scope of Linux Programming is development of any application with Linux platform in a highly secured manner by using Linux commands and shell script. In addition with provides inter process communication using system v ipc

3. PREREQUISITES

This lab recommends continuous practice of various console/window based operating systems. It needs requisite knowledge about basics of Disk Operating System commands and GUI of window based operating system.

4. LINKING OF LINUX PROGRAMMING SUBJECT WITH LAB EXPERIMENTS

Preamble: This lab covers the Linux shell script and C-programs in Linux environment. The JNTUH has given 28 lab programs in the syllabus out of which first nine programs are based on the shell script and rest of all based on C programs.

1. Write a Shell Script that accepts a file name, starting and ending line numbers as arguments and displays all lines between the given line numbers.(Unit –1)
2. Write a shell script that deletes all lines containing a specific word in one or more files supplied as arguments to it. (Unit-1)
3. Write a shell script that displays a list of files in current directory to which the user has read, write and execute permissions. (Unit -2)
4. Write a shell script that receives any number of file names as arguments, checks if every argument is a file or directory, and when it is a file, reports the no. of lines in it.(Unit -2)
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.(Unit-2)
6. Write a shell script to list all of the directory files in a directory. (Unit -2)
7. Write a shell script to find factorial of a given number. (Unit-2)

Objectives: The main objective of the above 7 programs is to enable the student to learn the various shell Meta characters, programming concepts like control structures and loops.

Prerequisites: Requires knowledge of basic syntax of control structures and loops in shell programming.

Application: Students can develop various applications file management system.

8. Write awk script to count no. of lines in a file that do not contain vowels. (Unit -1)
9. Write awk script to count no. of characters, words, lines in a given file. (Unit -1)

Objectives: The main objective of the above 2 programs is to enable the student to learn the various awk concepts like table creation and insert/delete/update/retrieve the records from it.

Prerequisites: Requires knowledge of database commands like create, update, insert and delete.

Application: The student can develop various applications like database creation and perform various add/remove operations.

10. Write a C program that makes a copy of a file using standard I/O and System calls.(Unit -3)

11. Implement in C the following UNIX commands using system calls:

A.cat B.ls C.mv (Unit 3)

12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:

A. file type B. Number of links C. Time of last access D. read, write and execute permissions.
(Unit 2)

13. Write a C program to implement ls -l command. (Unit 3)

14. Write a C program to list every file in a directory, node number and file name. (Unit 3)

15. Write a C program to demonstrates redirection of standard output to a file ls>f1 (Unit 3)

16. Write a C program to create a child process and allow the parent to display parent and child to display child on screen. (Unit 3)

Objectives: The main objective of the above 7 programs is to enable the student to execute the various command by using C programs.

Prerequisites: Requires knowledge of C language.

Application: To learn basic file manipulation operations by using programming instead of commands like create, copy and remove.

17. Write a C program to create Zombie process (Unit 5)

18. Write a C program to create Orphan process. (Unit 5)

Objectives: The main objective of the above 2 programs is to enable the student to learn the various process formats.

Prerequisites: Requires knowledge of process state diagram and functions like fork() and vfork().

Application: To apply the concepts in process scheduling algorithms.

19. Write a C program that illustrates how to execute two commands concurrently with a command pipe (Unit 5)

20. Write a C program that illustrates communication between 2 unrelated processes using named pipe. (Unit 5)

21. Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers. (Unit -5)

22. Write a C program that receives the messages from message queue and displays them. (Unit 6)

23. Write a C program to allow cooperation processes to lock a resource for exclusive use using a) semaphores b) flock or lockf system calls (Unit 6)

24. Write a C program that illustrates suspending and resuming processes using signals. (Unit 4)

25. Write a C program to implement producer-consumer Problem using two processes. (Unit 5)

Objectives: The main objective of the above 7 programs is to enable the student to learn the various inter process communication.

Prerequisites: Require knowledge about basics of IPC.

Application: To apply this concept in development of applications like reservation systems and retail marketing software.

26. Write a Client-Server program using UNIX domain Sockets. (Unit 8)

27. Write a Client-Server program using internet domain sockets. (Unit 8)

28. Write a C program that illustrates 2 process communicating using shared memory.(Unit 6)

Objectives: The main objective of the above 3 programs is to enable the student to learn the various remote inter process communication.

Prerequisites: Requires knowledge about basics of IPC.

Application: Applicable in development of ARP and DHCP protocols

LEAD PROGRAM

29. Write a shell Script to create 100 users as named from user1 to user100.

30. Secure copy between processes

Objectives: The main objective of the above 2 programs is to enable the student to learn the instant creating of users and to securely copy the contents from one user to other.

Prerequisites: Requires knowledge about basics of Unix Commands like adduser and password.

Application: Apply in Linux operating system application like human resource management application with high security.

5 (A) LAB SCHEDULE:

CYCLE 1:

Batches	week-1	week-2	week-3	week-4	week-5	week-6	week-7	week-8
B1(501 to 512)	Demo & Basic commands	Exp.1,2&3	Exp.4 ,5&6	Exp.6,7&8	Exp.9&10	Exp.11 & 12	test	Exp.13&14
B2(513 to 524)	Demo & Basic commands	Exp.1&2	Exp.3 &4	Exp.5 &6	Exp.7 &8	Exp.9 & 10	test	Exp.13&14
B3(525 to 536)	Demo & Basic commands	Exp.1&2	Exp.3 &4	Exp.5 &6	Exp.7 &8	Exp.9 & 10	test	Exp.13&14
B4(537 to 548)	Demo & Basic commands	Exp.1&2	Exp.3 &4	Exp.5 &6	Exp.7 &8	Exp.9 & 10	test	Exp.13&14
B5(549 to 560)	Demo & Basic commands	Exp.1&2	Exp.3 &4	Exp.5 &6	Exp.7 &8	Exp.9 & 10	test	Exp.13&14

CYCLE 2

4.(B) VIVA SCHEDULE: The viva schedule should be planned prior starting to the lab experiment.

CYCLE 1:

ROUND - 1

Batches	week-1	week-2	week-3	week-4	week-5	week-6	week-7	week-8	week-9	week-10	week-11	week-12	week-13	week-14
B1,B2,B3	viva					viva					viva			
B4,B5,B1		viva					viva					viva		
B2,B3,B4			viva					viva					viva	
B5,B1,B2				viva					viva					viva
B2,B3,B4					viva					viva				

(C) Scheme of Evaluation:

The scheme of evaluation for internal and external exams as follows:

<u>LAB INTERNAL:</u>							
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Uniform	Observation & Record	Performance Of the Experiment	Result	Viva	Write up	Execution & Results	Viva
Marks-3	Marks-3	Marks-3	Marks-3	Marks-3	Marks-4	Marks-3	Marks-3
Total Marks-25							

LAB EXTERNAL:			
S.NO	Write up	Final Evaluation	Viva
1	1. Aim 2. Procedure 3. Program 4. Expected output.	Based on correctness of the program and Results	Based on understanding of Experiment and theoretical questions in the related subjects
Marks	20	20	10
Total Marks-50			

6. SUGGESTED BOOKS:.

- I) Advanced UNIX programming by B.Venkateswarlu PHI publications 3rd edition.
- ii) Unix System Programming using C++, T.Chan, PHI
- iii) UNIX Concepts and Applications, 4th Edition, Sumitabha Das, TMH.

7. WEBSITES

- 6. www.advancedlinuxprogramming.com/.../advanced-linux-programming.
- 7. fita.hua.edu.vn/pttien/Setups/.../beginning-linux-programming.pdf
- 8. www.cse.hcmut.edu.vn/~hungnq/courses/nap/alp.pdf
- 9. <https://sites.google.com/site/linuxlabjntu09/home>
- 5. <http://youtube.com/linux>
- 6. <http://www.nptel.com/computerscience/Linuxprogramming>
- 7. <http://nptel.iitm.ac.in/courses.php?disciplineId=106>
- 8. <http://manuals.bioinformatics.ucr.edu/home/linux-basics>

