

LINUX PROGRAMMING LABORATORY

III Semester: CSE(CS)

IV Semester: CSE / CSIT / CSE(DS)

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
ACSC16	Core	1	0	2	2	30	70	100
Contact Classes: 12	Tutorial Classes: Nil	Practical Classes: 24			Total Classes: 36			

Prerequisite: Programming for Problem Solving using C Laboratory

I. COURSE OVERVIEW:

This course covers operating system concepts in linux environment. It focuses on practice on shell commands and demonstration of process concepts such as creation and establishing communication using linux system calls. The main objective of the course is to teach the students how to work with linux environment and demonstration of operating systems concepts using linux system calls in C programs. This course reaches to student by power point presentations, lecture notes, and lab which involve the problem solving in mathematical and engineering areas.

II. COURSE OBJECTIVES:

The students will try to learn:

- I. Familiar with the Linux command-line environment.
- II. Understand system administration processes by providing a hands-on experience.
- III. Understand Process management and inter-process communications techniques

III. COURSE SYLLABUS:

Week-1: BASIC COMMANDS I

Study and Practice on various commands like man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w.

Week-2: BASIC COMMANDS II

Study and Practice on various commands like cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, tar, cpio.

Week-3: SHELL PROGRAMMING, I

- a) Write a Shell Program to print all .txt files and .c files.
- b) Write a Shell program to move a set of files to a specified directory.
- c) Write a Shell program to display all the users who are currently logged in after a specified time.
- d) Write a Shell Program to wish the user based on the login time.

Week-4 : SHELL PROGRAMMING II

- a) Write a Shell program to pass a message to a group of members, individual member and all.
- b) Write a Shell program to count the number of words in a file.
- c) Write a Shell program to calculate the factorial of a given number.
- d) Write a Shell program to generate Fibonacci series.

Week-5: SIMULATING COMMANDS I

- a) Simulate cat command
- b) Simulate cp command

Week-6: SIMULATING COMMANDS II

- a) Simulate tail command
- b) Simulate head command

Week-7: SIMULATING COMMANDS III

- a) Simulate mv command
- b) Simulate nl command

Week-8: SIGNAL HANDLING

Write a program to handle the signals like SIGINT, SIGDFL, SIGIGN

Week-9: INTERPROCESS COMMUNICATIONS

Implement the following IPC forms

a) FIFO b) PIPE

Week-10: MESSAGE QUEUES

1. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
2. Write a C program (receiver.c) that receives the messages (from the above message queue as specified and displays them.

Week-11: SHARED MEMORY

Implement shared memory form of IPC.

Week-12: SOCKET PROGRAMMING

1. Write client and server programs (using c) for interaction between server and client processes using TCP Elementary functions.
2. Write client and server programs (using c) for interaction between server and client processes using UDP Elementary functions.

Reference Books:

1. Sumitabha Das, "Your Unix The Ultimate Guide", Tata McGraw-Hill, New Delhi, India, 2007.
2. B. A. Forouzan and R. F. Gilberg, "Unix and Shell Programming", Cengage Learning.
3. Robert Love, "Linux System Programming", O'Reilly, SPD.
4. Stephen G. Kochan, Patrick Wood, "Unix Shell Programming", Sams publications, 3rd Edition, 2007.
5. T. Chan, "Unix System Programming using C++", Prentice Hall India, 1999.

Web References:

1. http://spoken-tutorial.org/tutorial_search/?search_foss=Linux&search_language=English
2. <https://www.redhat.com/en/files/resources/en-rhel-whats-new-in-rhel-712030417.pdf>
3. <http://www.tutorialspoint.com/unix/>
4. <http://cse09-iiith.virtual-labs.ac.in/>