Program :	**Diploma in Computer Engineering / Cyber Forensics and Information Security / Computer Hardware Engineering**
Course Code : **5138**	Course Title: **System Administration lab**
Semester : **5 / 3 / 3**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0 T:0 P:3)**	Periods per semester: **45**

Course Objectives:

- Provide practical knowledge to apply Linux commands for the efficient use of operating system
- Expertise in shell scripting in Linux platform

Course Prerequisites:

Topic	Course code	Course name	Semester
Knowledge in computer and system software		Introduction to IT Systems	1

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Demonstrate user management and directory management in Linux platform using commands.	12	Applying
CO2	Make use of pipes and filters in Linux commands	6	Applying
CO3	Demonstrate process management, backup and recovery management on Linux platform using commands.	6	Applying
CO4	Implement shell scripting in Linux platform for system administration	18	Applying
	Lab Exam	3	

CO-PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3			3			
CO2	3			3			
CO3	3			3			
CO4	3			3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Name of Experiment	Duration (Hours)	Cognitive Level
CO1	**Demonstrate user management and directory management in Linux platform using commands.**		
M1.01	Illustrate the structure of Linux Operating System, file and directory organization.	2	Understanding
M1.02	Demonstrate the management of system using Linux commands - date, time, pwd, ps, who, whoami, uptime, users, groups	3	Applying
M1.03	Demonstrate the management of users and groups on Linux Platform using commands - useradd, passwd, usermod, userdel, groupadd, groupmod, groupdel, gpasswd	3	Applying
M1.04	Demonstrate management of files, directories and its permissions using Linux commands - ls, mkdir, cd, rmdir, mv, touch, cp, mv, rm, chmod, chage, sudo, chown	4	Applying
CO2	**Make use of pipes and filters in Linux commands.**		
M2.01	Demonstrate the concept of input and output redirections on Linux	2	Understanding
M2.02	Demonstrate the usage of pipes and filters using Linux commands - wc, cut, paste, comm, uniq, more, less, cmp, diff, sort, file sleep, uniq, grep.	4	Applying
	Lab Exam – I	1.5	

CO3	**Demonstrate process management, backup and recovery management on Linux platform using commands.**		
M3.01	Demonstrate process management using commands - bg, fg, top, ps, pidof, nice, renice, df, free, kill, pkill	3	Applying
M3.02	Demonstrate backup and recovery management using commands tar, cpio, dump	3	Applying
CO4	**Implement shell scripting in Linux platform for system administration**		
M4.01	Demonstrate the concept of shell and types of shells used in Linux Operating System	2	Understanding
M4.02	Implement shell script to manage systems.	4	Applying
M4.03	Implement shell script to manage system users.	4	Applying
M4.04	Implement shell script to perform the operations on files and directories.	4	Applying
M4.05	Implement shell script for the management of system process.	4	Applying
	Lab Exam – II	1.5	

Text /Reference:

T/R	Book Title/Author
T1	Richard Petersen, **Linux: The Complete Reference**, Sixth Edition
T2	Richard Blum, **Linux Command Line and Shell Scripting Bible**, 3rd Edition
R1	Sumitabha Das, **Unix Concepts and applications**
R2	Arnold Robbins, Bash Pocket Reference: Help for Power Users and Sys Admins

Online Resources:

Sl.No	Website Link
1	https://www.javatpoint.com/linux-tutorial
2	https://www.javatpoint.com/shell-scripting-tutorial
3	https://www.tutorialspoint.com/unix/shell_scripting.htm

Suggested Open Ended Projects

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can do open ended experiments as a group of 2-3. There is no duplication in experiments between groups)

1. Perform the following tasks using Linux Commands
   a) Create directory named Computer
   b) Create two subdirectories Hardware and Software under Computer
   c) Create text file under each subdirectories
   d) Apply copy, rename and delete operations on files and directories
2. Obtain the following results
   a) Create user and set password
   b) To print the login name
   c) Create group and add existing user to group.
3. Write a menu-driven shell script program for the following operations
   a) List of files
   d) Processes of users
   e) Today's Date
   f) Quit out of Linux
4. Write a shell script to accept the file name from the standard input and performs the following tests
   a) File existence
   b) File readable and writable