COURSE TITLE	**LINUX ESSENTIALS**
COURSE CODE	**05CA0205**
COURSE CREDITS	**2**

Objective:

1 To provide an understanding of the Linux operating system and its components.
2 To enable students to perform basic and advanced tasks in Linux.
3 To teach the students how to navigate the Linux file system, use shell commands, and manage processes.
4 To develop skills to write shell scripts and automate tasks in Linux.
5 To introduce students to Linux system administration and networking.

Course Outcomes: After completion of this course, student will be able to:

1 Students will be able to understand the Linux operating system architecture and components.
2 Students will demonstrate proficiency in using basic Linux commands to manage files, directories, and processes.
3 Students will be able to write and execute shell scripts to automate tasks.
4 Students will be able to configure basic networking and system administration tasks on Linux.
5 Students will be able to troubleshoot and resolve common Linux system issues.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	4	0	0	0	25	25

Contents : Unit	Topics	Contact Hours
Total Hours		

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Unit 1** Install Linux using WSL2/VMWare/ Virtual Box on Windows or create a dual boot with Linux and Windows. Use pwd, ls, and cd to navigate through directories. Create files using touch, rename using mv, and delete using rm. Use cat, less, and head to view files. Modify files using echo and nano. Create nested directories using mkdir and remove them using rmdir. Search for patterns in a file using grep and sort data with sort. Use commands like uname, whoami, and df to get system details. View active processes using ps, terminate a process with kill, and manage background tasks with jobs. Download a file using wget and find its location with locate. Perform a sequence of commands to create, organize, search, and sort files within a directory. What is the difference between cat and less commands in Linux? How do you display the calendar for the current month in Linux? Which command is used to clear the terminal screen? How can you find the location of an installed command in Linux? What does the df -h command display? How do you display the system uptime in Linux? What does the sort -r command do, and when would you use it? How can you search for files with a specific extension in a directory? What is the difference between wget and curl commands? How do you append text to an existing file using the echo command?	30
2	**Unit 2** List directory contents using ls -l and understand permissions and ownership. Create, copy, move, and delete files using touch, cp, mv, and rm. Create directories, navigate them, and remove them using mkdir and rmdir. Use ls -l to list file permissions and analyze the output. Change file permissions using chmod with symbolic and octal notations. Change file ownership using chown and group ownership using chgrp. Apply setuid, setgid, and sticky bit permissions on files/directories. Create soft and hard links using ln. Simulate common permission errors and resolve them using chmod and chown. Create a directory structure with files, set permissions for different users, and demonstrate file operations. What is the significance of the setuid and setgid bits in file permissions? How can you restrict file access to the file owner only? How do you remove write permissions for a group on a file using chmod? How can you check the number of hard links associated with a file? What is the purpose of the sticky bit in directory permissions? How do you recursively change the permissions of all files and subdirectories within a directory? How can you create a file and assign specific permissions at the same time? What command is used to view the effective permissions of a symbolic link? How do you check and modify default permissions for newly created files in Linux? What is the command to change the ownership of a directory and all its contents?	30
Total Hours		**60**

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Textbook :

1 Linux Administration: A Beginner's Guide, Wale Soyinka, McGraw-Hill Education, 2014

References:

1 Linux Command Line and Shell Scripting Bible, Linux Command Line and Shell Scripting Bible, Richard Blum, Wiley, 2015

2 The Linux Programming Interface, The Linux Programming Interface, Michael Kerrisk, No Starch Press, 2010

3 Linux Pocket Guide, Linux Pocket Guide, Daniel J. Barrett, O'Reilly Media, 2016

4 The Linux Command Line, The Linux Command Line, William E. Shotts, No Starch Press, 2012

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 Demo

2 PPT

Supplementary Resources:

1 https://tldp.org/

2 https://www.geeksforgeeks.org/linux-tutorial/

3 https://ubuntu.com/tutorials

4 https://explore.skillbuilder.aws

5 https://www.digitalocean.com/community/tutorials/linux-commands

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