

Subject Code: 01CT2509

Subject Name: Linux Administration

B. Tech. Year – III (Semester V)

Objectives: To impart knowledge and skills on various practical and theoretical aspects of Linux operating system (OS) basics and Linux OS based server configuration, management and administration.

Credits Earned: 04 Credits

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

1. Understand Linux utilities to create and manage simple file processing operations and Linuxboot processing (Understand).
2. Apply Command line in Linux to manage user, user groups, system management, volumemanagement, and troubleshooting application, scheduling task and system level issue (Apply).
3. Illustrate client server applications with appropriate security (Apply).
4. Configure various services of Linux such like DNS, Apache web server, virtualization (Apply).
5. Evaluate various shell Scripting (Analyze).

Pre-requisite of course: Basics of Operating System

Teaching and Examination Scheme:

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
3	0	2	4	50	30	20	25	25	150

Content:

Unit	Topics	Content Hours
1	Introduction And Installation Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File System - Boot block, How Linux access files, storage files, Linux standard directories, Download, install, update, and manage software packages from Red Hat and yum package repositories.	05
2	Management of Files Using Command Lines	05

	Introduction to BASH, Command-line shortcuts, File Types, Ownership and Permissions, File management and manipulation, Moving users & its directories, Miscellaneous Tools, Editors, Create and Edit text files with vim (open, edit, and save text files) Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp& comm, View files, disk related commands, checking disk free spaces, regular expressions with grep	
3	Managing Users and Groups Creating and managing user/s and group commands, User management tools, Users and Access Permissions, Updating users and group attributes	04
4	Booting and shutting down Boot Loaders, the init process, rc scripts, enabling and disabling services, Booting in recovery mode	04
5	File Systems Makeup of file systems, managing file systems, adding a new disk, Volume Management, Creating file systems.	03
6	Core System Services The init Daemon, xinetd and inetd, The Logging Daemon, Configuring Logging Daemon, The CRON program	05
7	Compiling the Linux Kernel Kernel concepts, Finding Kernel Source Code, Building the Kernel, Patching the Kernel	04
8	DNS Installing DNS Server, Configuring DNS server, DNS records types, setting up BIND database file, The DNS Toolbox, Configuring DNS clients.	04
9	Apache Web Server HTTP Protocol, Installing Apache HTTP Server, starting up and shutting down Apache, Testing Apache Installation, Configuring Apache, Troubleshooting Apache.	04
10	Virtualization Virtualization Implementation, Kernel based Virtual Machines (KVM), Containers, Docker, Kubernetes	04
	Total Hours	42

Suggested Text books / Reference books:

1. Steve Shah and Wale Soyinka “Linux Administration: A Beginner’s Guide”, 4th Edition, TataMcGraw-Hill Publishing Company Limited, New Delhi, ISBN: 978- 0072262599
2. Susan Lauber, Philip Sweany, Rudolf Kastl and George Hacker, “REDHAT System Administration-1 Student Work book”, REDHAT Inc. 2014

Suggested Theory distribution:

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

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
15%	20%	30%	20%	10%	5%

Suggested List of Experiments:

1. Linux introduction & Installation of Linux-Operating system.
2. Software package management, mount and unmount the disks, devices
3. File Handling Commands
4. User Handling Commands
5. Group Handling Commands
6. Startup and Shutdown Commands
7. Installation and Configuration of DNS server
8. Installation and Configuration of Apache Server
9. Building and patching Linux Kernel.
10. Write a command with syntax & usage and execute the advance filters such as grep, egrep, fgrep.
11. Write a command with syntax & usage then execute the ps command, process management commands: & nohub, kill, nice.
12. Write a command with syntax & usage then execute the communication commands.
13. To execute device pattern using Meta character to match each of the following.
14. File Moment Using Command Line Arguments
15. Configuring different servers (FTP, SSH, NFS, NTP Time Server, DHCP, Samba)

Supplementary Resources:

1. https://www.tutorialspoint.com/linux_admin/index.htm
2. <https://linode.com/docs/tools-reference/linux-system-administration-basics/>
opensourceforu.com/2016/07/introduction-linux-system-administration/
<https://www.linuxfoundation.org>