



AMITY UNIVERSITY
UTTAR PRADESH

FORMAT FOR COURSE CURRICULUM

Course Title: Linux for Devices

Credit Units: 4

Course Level: UG

Course Code: CSE-438

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	-	2	-	4

Course Objectives:

After finishing this course, student will be able to get understand the basics of Linux. This course explores the basic characteristics of Linux Networking. Moreover, it also helps in learning about Linux Shell, File Structure and Network Administration Services. Finally, it gives overview about the Linux Security Techniques.

Pre-requisites:

Knowledge of Networking and Operating System

Course Contents/Syllabus:

	Weightage (%)
Module I Linux Basics and Industrial Application	20%
Descriptors/Topics Introduction to Linux, File System of the Linux, General usage of Linux kernel & basic commands, Linux users and group, Permissions for file, directory and users, Searching a file & directory, zipping and unzipping concepts; Linux for the Industry 4.0 Era, OPENIL and its advantages, Features of OPENIL	
Module II Linux Networking and Docker	20%
Descriptors/Topics Introduction to Networking in Linux, Network basics & tools, File transfer protocol in Linux, Network file system, Domain Naming Services, Dynamic hosting configuration Protocol & Network information Services; Study of Docker concepts: Installation on Linux, defining containers and Images and there usage	
Module III The Linux Shell and File Structure	20%

Descriptors/Topics Using The Shell, Moving Around the Filesystem, Working around the Text Files, Managing Running Processes, Writing Simple Shell Scripts, Linux Files, Directories, Archives	
Module IV Network Administration Services	20%
Descriptors/Topics Managing User Accounts, Managing Disks and Filesystems, Understanding Server Administration, Administering TCP/IP Networks, Starting and Stopping Services, Configuring an NFS File Server, Distributed Network File Systems	
Module V Linux Device Drivers	20%
Descriptors/Topics Introduction & Character device drivers, Hardware access mechanisms, Interrupts, Time keeping, delays and deferred work, Concurrency, USB drivers	

Course Learning Outcomes:

At the end of the course, the students will be able to:

1. Perform the basic operations for Linux.
2. Compare the various Linux security techniques.
3. Implement the Docker in Linux.
4. Execute the shell scripts on Linux.
5. Devise the network administration services.
6. Able to design device drivers.

Pedagogy for Course Delivery:

Various modes of delivery can be adopted for teaching this course:

1. Problem based learning
2. Work based learning
3. Blended learning

Lab/ Practical details, if applicable:

List of Experiments:

1. Installation of Unix/Linux operating system.
2. Study of logging/logout details.
3. Study of Unix/Linux general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands.
4. Study of vi editor.

5. Implementation of docker on Linux operating system.

6. Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
7. Study of Unix/Linux file system (tree structure).
8. Study of .bashrc, /etc/bashrc and Environment variables.
9. Write a shell script program to display list of user currently logged in.
10. Write a shell script program to display “HELLO WORLD”.
11. Write a shell script program to develop a scientific calculator.
12. Write a shell Script program to check whether the given number is even or odd.
13. Shell script Program to search whether element is present is in the list or not.
14. Shell script program to check whether given file is a directory or not.
15. Shell script program to count number of files in a Directory.
16. Shell script program to copy contents of one file to another.
17. Create directory, write contents on that and Copy to a suitable location in your home directory.
18. Use a pipeline and command substitution to set the length of a line in file to a variable.
19. Write a program using sed command to print duplicated lines of Input.
20. Study the process of writing a device driver, or a kernel module.(Reference: <https://www.apriorit.com/dev-blog/195-simple-driver-for-linux-os>)

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
75%	25%	100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment (40%)					End Term Examination (60%)
Components (Drop down)	Attendance	Class Test	Assignment	Quiz	
Weightage (%)	5	15	10	10	60

Lab Assessment

Continuous Assessment/Internal Assessment (40%)					End Term Examination (60%)
Components (Drop down)	Attendance	Lab Record	Performance	Viva	Exp (30) Viva (30)
Weightage (%)	5	10	15	10	60

Text Reading:

- Linux Bible, The comprehensive Tutorial Resource, 8th Edition
- Linux: The Complete Reference, Sixth Edition
- Linux Programming and Scripting, Video Course NPTEL
- Linux Device Drivers by Jonathan Corbet, Alessandro Rubini, Greg Kroah-Hartman

References:

- <https://www.openil.org/>
- <https://docker-curriculum.com/>