**Linux System Administration**

**Introduction:** History, Linux Foundation, H/W Requirements, Linux Components, Distributions, Features, Choosing a suitable Linux distribution

**Linux architecture,** Kernel, Architectural differences between Windows and Linux. Configuration & customizations of Linux, Linux structure, and Installation.

**Installation:** Different ways to install Linux, Linux installation (CentOS7 - Recommended), CentOS vs. CentOS stream, Take a snapshot of VM.

**Boot Process:** The boot process, Partitioning, dual boot, Virtual memory and swap space disk partition (df, fdisk), Adding swap space.

**File System & Storage Management:** File system structure, Navigation commands (cd, ls and pwd), Absolute and relative Paths, Creating files and directories (touch, cp, mkdir) , Disk partitions and file systems, Mounting and unmounting file systems (mount, umount), Managing disk space (df, du)

**Working with Files & Directories:** Linux file types, find, locate, Changing Password, cp, rm, mv, mkdir, rmdir)

**File Display Commands:** cat, less, more, head, tail) redirection, Files and directory permissions

(chmod), File ownership commands (chown, chgrp)

**Editors:** Linux file editor (vi), Difference between vi and vim editors, nano, pico and other linux editors,"sed" command.

**Filters / Text Processing Commands:** cut, awk, grep/egrep, sort/uniq, wc, compare files (diff and cmp), Compress and uncompress (tar, gzip, gunzip).

**User Account Management:** useradd, groupadd, usermod, userdel, groupdel, Switch users and sudo access (su, sudo), Monitor users (who, last, w, id).

**System Utility Commands:** date, uptime, hostname, uname, which, cal, bc.

**Process Management & System Monitoring:** ps, bg, fg, nice commands.

**Troubleshooting:** ifconfig, ping, traceroute, DNS troubleshooting tools etc.

**Web and Database Services:** Configuring web servers (Apache, Nginx), Setting up databases (MySQL, PostgreSQL), Managing web applications, Automation and Scripting, Introduction to shell scripting (Bash), Automating tasks with scripts, Using configuration management tools (Ansible)

**Shell Scripting:** Shell scripting basics, Types of shells, starting a shell, Create your first script - Hello world, Conditions/If else statements Scripts, Case statements script, Conditions/If else statements, Scripts, Case statements script, for loop script, do-while scripts, Exit status, Script, For loop script, do-while scripts, Exit status

**Introduction to GCC compiler: Basics of GCC, Compilation of program, Execution of program, Time stamping.**