

*Suggested Teaching Guidelines for*

***Linux Operating System & Perl – PG-DHPCSA September 2022***

**Duration:** 40 class room hours + 40 Lab hours

**Objective:** To introduce Linux environment and hands on Shell programming & Perl.

**Prerequisites:** Knowledge of Computer Fundamentals

**Evaluation method:** CCEE Theory exam– 40% weightage

Lab exam – 40% weightage

Internal exam – 20% weightage

**List of Books / Other training material**

**Text Book:**

1. Linux: The Complete Reference by Richard Petersen /Mcgraw Higher Ed

**Reference:**

1. Linux Administration: A Beginner's Guide 6th Edition by Wale Soyinka/TMH
2. Beginning Unix – Joe Marilino (Wrox Publication)
3. Linux Command Line and Shell Scripting Bible – Blum (Wiley – India)
4. Beginning Perl - Curtis "Ovid" Poe /Wiley

**Note: Each session mentioned is for theory and of 2 hours duration. Lab assignments are indicatives, faculty need to assign more assignments for better practice.**

**Session 1:**

**Lecture: Introduction to PERL**

- ° Why PERL Script
- ° Perl files extension
- ° Advantage of Perl
- ° System command to use Perl
- ° Comment entry
- ° Print stuff on screen

**Session 2:**

**Lecture: Language Variable Used in Perl**

- ° Scalar variables
- ° List variables
- ° Push, pop, shift, unshift, reverse
- ° Hashes, keys, values, each
- ° Read from terminal, command line arguments
- ° Read and write to files
- ° Push, pop, shift, unshift, reverse operator

**Session 3:**

**Lecture: Control Statement**

- ° While / until statements
- ° For statements
- ° Foreach statements
- ° Last, next, redo statements
- ° && And || as control structures

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- Function declaration
- Calling a function
- Passing parameters
- Local variables
- Returning values

**Session 4:**

**Lecture: Regular Expression**

- Split and join
- Matching & replacing
- Selecting a different target
- \$&, \$', And \$`
- Parenthesis as memory
- Using different delimiter

**Session 5:**

- File Handling,
- Introduction to Modules and Packages,
- Database Connectivity

**Session 6:**

**Introduction to Operating System and it's Architecture**

- Introduction to operating systems and terminologies
- Kernel Components and Non-kernel Components
- User-space vs Kernel-space
- H/W Interrupts/ handler

**Session 7:**

**Process Management**

- Process management
- Process Scheduling
- CPU Scheduling
- Preemptive vs Non-Preemptive
- Algorithm-FCFS, RR

**Session 8:**

**Memory Management & File System Management**

- Virtual Memory Techniques
- Page Replacement Algorithm
- Segmentation/ Paging
- File System Organization
- Physical File System Organization Techniques FAT/NTFS file system manager in the kernel

**Session 9:**

**Introduction to Linux**

- Introduction to Linux
- Getting Acquainted with the Linux Environment

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- ° Use various commands in Linux system.
- ° (ls, cp, mv, lpr, sort, grep, cat, tac, more, head, tail, man, whatis, whereis, locate, find, diff, file, rm, mkdir, rmdir, cd, pwd, ln and ln -s, gzip and gunzip, zip and unzip, tar and its variants, zcat, cal, bc and bc -l, banner date, time, wc, touch, echo, who, finger, w, whoami, who am i, alias, unalias, touch, push, pop, jobs, ps, etc.)

**Assignment – Lab:** Getting acquainted with the Linux Environment Use various commands in Linux system.

**Session 10 & 11:**

**Working with Linux**

- ° The Linux File System
- ° Disk Partition
- ° Working with Files and Directories
- ° Linux Boot process
- ° Startup files
- ° Installation of Linux operating system

**Session 12:**

- ° Controlling and managing Services
- ° Access control list and chmod command
- ° chown and commands
- ° Network Commands like telnet, ftp, ssh, and sftp, finger
- ° Overview of Log management

**Session 13:**

- ° System Configuration Files
- ° Network Configuration
- ° Network Monitoring and Troubleshooting (netstat/iproute2)

**Session 14 & 15:**

- ° Introduction to BASH Command Line Interface (CLI)
- ° Control Structure, Loop
- ° Variable & String

**Assignment – Lab:** Create a shell script that will return the following set of system information.

1. Hostname and Logged-in users
2. File system disk space usage
3. Free and used memory
4. System uptime and Load

**Session 16 & 17:**

- ° Error Handling
- ° Debugging & Redirection of scripts
- ° Conditional Statement Regular Expressions

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**Session 18 & 19:**

- ° Automate Task Using Bash Script
- ° Security patches

**Session 20:**

- ° Logging & Monitoring using script

**Assignments:**

- ° Hands on Linux Commands, Vim Editor
- ° Creating partitions in Linux OS.
- ° Practices on – sudo, chown and chmod
- ° Perform adding a user, Delete user, Modify user, Hidden Files
- ° Hands On Ps command, Top command, Kill command, Expect
- ° Creating scripts (shell & Perl) for various purpose (automation, monitoring, scheduling, etc.,)
- ° Case studies to enhance proficiency in Linux OS and administration.
- ° A sample program with error and exception handling written using the Coding standard
- ° Implementing all OOPS concept in the Perl program.
- ° Hands on Working with MySQL and Passing values using HTML form.
- ° Writing a program to send an email in perl.
- ° Writing a program to implement CRUD operation on the file using perl.