

CSE-401	Unix & Linux Programming						
Lecture	Tutorial	Practical	Credit	Major Test	Minor Test	Total	Time
4	0	0	4	75	25	100	3 Hrs.
Purpose	Introduces commands and numerous programming concepts and application domains to cover important topics for implementation of the Unix programming concepts.						
Course Outcomes (CO)							
CO1	To learn basic and advanced Unix Commands.						
CO2	Expose the role of filters and file compression techniques.						
CO3	To explore knowledge of programming language development tools.						
CO4	To expand knowledge of Unix/Linux system administration and networking.						

Unit I: Basic Command Usage

Linux Startup: User accounts, accessing Linux - starting and shutting processes, Logging in and Logging out, Unix commands like zip, unzip, pack, unpack, compress, uncompress, Shell Programming, Unix file system: Linux/Unix files, i-nodes and structure, file system related commands, Shell as command processor, shell variables, creating command substitution, scripts, functions, conditionals, loops, customizing environment

Unit II: Filters and File Compression

Regular Expressions and Filters: Introducing regular expressions patterns, syntax, character classes, quantifiers, introduction to grep, egrep, sed, programming with awk and perl, File Compression Techniques: data redundancy elimination using fingerprint generation deduplication and data similarities removal using delta techniques for data reduction storage, parallel compression with Xdelta utility.

Unit III: Program Development Tools

The C Environment: C compiler, vi editor, compiler options, managing projects, memory management, use of makefile, cmake, dependency calculations, memory management – static and dynamic memory, static and dynamic libraries, dynamic loader, debugging tools like gdb, fixed-size and variable-size blocks of data files chunks divisor chunking techniques like Frequency Based Chunking and Content Defined Chunking Unix based open source coding.

Unit IV: Process Control

Processes in Linux: Processes, starting and stopping processes, initialization processes, rc and init files, job control - at, batch, cron, time, network files, security, privileges, authentication, password administration, archiving, Signals and signal handlers, Threading, Linux I/O system, Networking tools like ping, telnet, ftp, route, Firewalls, Backup and Restore tar, cpio, dd.
Case Study: PCOMPRESS open source free software

Text Books:

1. John Goerzen: Linux Programming Bible, IDG Books, New Delhi, 2014.
2. Sumitabha Das: Unix – Concept and Applications, Fourth Edition TMH, 2015.
3. Neil Matthew, Richard Stones: Beginning Linux Programming, 4th. Edition, Wrox-Shroff, 2011.
4. Welsh & Kaufmann: Running Linux, O'Reiley & Associates, 2013.

Reference Book:

1. B.M. Harwani, *Unix and Shell Programming*, Oxford University Press, 2013.