

[Subject Code for theory- 2511000905044001]

[Subject Code for Practical-2511000905044002]

Course Code: 501
Course Title: Linux Operating System

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Course Title	Linux Operating System (LOS)								
Credits	4								
Course Category	Minor Course								
Level of Course	200-299 (Intermediate Level)								
Teaching per Week	4 Hrs. (3 Hours Theory + 2 Hours Practical work)								
Minimum Hours/ Semester	45 hours of Theory + 15 Hours of Practical (Including class work, examination, preparation etc.)								
Review / Revision	-								
Implementation Year:	A.Y. 2025-2026								
Purpose of Course	Learn the architecture and features of Linux systems. Get familiar with the Linux file system, processes, and user management. Use basic and advanced Linux commands for file manipulation, text processing, permissions, networking, etc., Navigate the file system, manage files/directories, and control user access.								
Course Objective	1. Understand the structure, design, and usage of Linux systems. 2. Gain hands-on experience with commands for file handling, process control, text processing, and system management. 3. Learn how to write, debug, and execute shell scripts using Bash or other shells to automate tasks. 4. Understand file types, directory structures, permissions, and access control. 5. Concepts of background/foreground jobs. 6. Use standard input/output effectively for chaining commands and redirecting data streams. 7. Apply logic and scripting to solve practical problems and streamline system operations.								
Pre-requisite	Understanding of operating systems, files, and general computer usage, Basic understanding of variables, loops, conditionals, and functions, Experience with any programming language (like C, Python, or Java) is helpful but not always required, Concepts like processes, memory, and file systems give a better context to Linux systems.								
Course Outcomes	CO1: Understand: Explain the structure and components of Linux systems. CO2: Apply: Use Linux commands for file handling, text processing, and system tasks. CO3: Create: Write and execute shell scripts to automate operations. CO4: Analyze: Analyze file types, permissions, and directory structures. CO5: Apply: Use redirection and pipes to control input/output streams.								
Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
Course Content	Unit 1 : Introduction to Linux Operating System 1.1 Features of Linux OS 1.2 Components of Linux OS (Hardware, Kernel, Shell, GNU Utilities & Applications) 1.3 Shell in Linux (Bash, Zsh, Dash – Features and Differences) 1.4 Introduction to Files and File Types in Linux (text, binary, special files) 1.5 Linux Directory Structure and File System Hierarchy Standard (FHS) Unit 2 : Basic Linux Commands 2.1 Directory Navigation Commands (pwd, cd, mkdir, rmdir, ls, tree)								

	2.2 File Management Commands (cat, rm, cp, mv, touch) 2.3 File Permissions and Ownership (chmod, chgrp, chown, umask) 2.4 Common System Commands (who, whoami, man, echo, date, clear) 2.5 Text Processing Commands (head, tail, cut, sort, cmp, tr, uniq, wc, tee) 2.6 Introduction to Process 2.7 Process Control commands : ps, fg, bg, kill, sleep 2.8 Job Scheduling commands : at, batch, crontab Unit 3 : Shell Scripting in Linux 3.1 Creating and Executing Shell Scripts (nano, vi, ./script.sh) 3.2 Shell Metacharacters and Operators 3.2.1 Filename Expansion (wildcards: *, ?, []) 3.2.2 Input/Output Redirection (>, >>, <) 3.2.3 Pipes () 3.2.4 Command Substitution (\${...}, ...) 3.3 Control Flow Structures (if-else, case, for, while, until) 3.4 Logical Operators (&&, , !) 3.5 test and [] command for Condition Testing (file, numeric, string) 3.6 Arithmetic Operations (expr, \$()) Unit 4 : Advanced Text Processing Tools 4.1 Introduction to Regular Expressions (Basic and Extended) 4.2 Pattern Matching using grep, egrep, and fgrep 4.3 Stream Editing with sed (search, replace, line deletion, insertion)
Reference Books	1. Operating System: Unix and Linux, Behrouz A. Forouzan and Richard F. Gilberg, Cengage India Pvt. Ltd., ISBN:9788131502980 2. UNIX Concepts and Applications, Sumitabha Das, McGraw Hill Education (India), ISBN:9781259006382 3. Introduction to UNIX and Shell Programming, M. G. Venkateshmurthy, Pearson Education India, ISBN:9788131704377 4. Linux Programming and Administration, N.B. Venkateswarlu, BPB Publications, ISBN:9788176567813 5. UNIX and Shell Programming, B.A. Forouzan & F. Gilberg, Cengage Learning India, ISBN:9788131508050 6. Linux Command Line and Shell Scripting Bible, Richard Blum and Christine Bresnahan, Wiley India Pvt. Ltd., ISBN:9788126562169 7. How Linux Works: What Every Superuser Should Know, Brian Ward, No Starch Press, ISBN:9781593275679 8. The Linux Programming Interface, Michael Kerrisk, No Starch Press, ISBN:9781593272203 9. Linux Pocket Guide, Daniel J. Barrett, O'Reilly Media, ISBN:9781491927571 10. UNIX and Linux System Administration Handbook, Evi Nemeth, Garth Snyder, Trent R. Hein, Ben Whaley, Dan Mackin, Pearson Education, ISBN:9780134277554
Teaching Methodology	Class Work, Discussion, Lab work, Self-Study, Seminars and/or Assignments
Evaluation Method	50% Internal assessment. - Attendance, Class and home Assignment, Unit tests. - Practical exam, viva-voce, E-Journal 50% External assessment. - Written Theory exam - Practical Exam, viva-voce