Course: 502 - UNIX and Shell Programming

Course Code	502
Course Title	UNIX and Shell Programming
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y.2022-2023
Purpose of Course	To provide basic knowledge and working of Multi-User Operating System – UNIX. The course includes CLI mode with BASH, I/O redirections, Init System, Processes, Users and Groups, File Systems, Files, Ownership, Permissions etc. It also includes VI text editor for creating shell scripts.
Course Objective	Unix provides an essential and simple set of tools in a distraction-free environment. The students will learn to write little pieces of software in a programming language called Bash, which allows to use and to connect together the UNIX tools.
Pre-requisite	Fundamental Knowledge of Operating System.
Course outcome	- Students will have practical introduction to commonly used Linux / UNIX shell commands and basics of Bash shell scripting to automate a variety of tasks. - Students will learn general purpose commands, directory management commands, file management commands, access control commands, text processing commands, etc with shell scripts. - Students will create simple to more advanced shell scripts that involve Metacharacters, Quoting, Variables, Command substitution, I/O Redirection, Pipes & Filters, and Command line arguments.
Course Content	**Unit - 1. Introduction of UNIX OS** 1.1. Features 1.2. System Structure and Architecture of UNIX OS 1.3. Shell & its Features 1.4. Kernel & its Structure **Unit 2. Overview** 2.1. Logging in & out 2.2. I-node and File System Structure 2.3. Booting Sequence & 'init' process 2.4. File Access Permissions **3. Shell Programming** 3.1. Screen Editor (vi) 3.2. Environmental & user defined variables 3.3. Conditional Execution 3.4. Arithmetic expression evaluation 3.5. Control Structure 3.6. Redirection 3.7. Background process & priorities of process, Batch Process 3.8. Argument Processing & Shells interpretation **Unit 4. Advanced Shell Programming** 4.1. Splitting, Comparing, Sorting, Merging & Ordering Files 4.2. Filtering utilities: grep, sed etc. 4.3. awk utility **Unit 5. Communication with other users** 5.1 write, wall and mesg 5.2 mail, motd and news

	[All Units carry Equal Weightage]
Reference Books	1. Unix Shell Programming, 3rd Edition Stephen G Kochan, Patrick Wood Sams Publishing 2. sed & awk, 2nd Edition Dale Dougherty, Arnold Robbins O'Reilly Media 3. The UNIX Programming Environment Kernighan & Pike PHI 4. The design of the UNIX OS M. J. Bach - Prentice Hall 5. Operating Systems A. S. Godbole Tata McGrew Hill 6. Working with UNIX Vijay Mukhi BPB Publications 7. UNIX Shells Vijay Mukhi BPB Publications. 8. UNIX System Concepts & Applications Das Tata McGraw Hill. 9. UNIX & Shell Programming Yashwant Kanetkar BPB Publications. 10. UNIX: The Complete Reference, Second Edition - Kenneth H.Rosen, Douglas A. Host,Rachel Klee, James Farber, Richard Rosinski - 2007 by The McGraw-Hill Companies
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.