

# SYLLABUS

## M.Sc. IT SEMESTER-I

Paper Code: MS - 66

### Paper Title: LINUX SYSTEM ADMINISTRATION AND PROGRAMMING

Maximum Marks: 80

Number of Lectures: 90 (45 minutes duration)

**Objective:** This course enables students to get familiar with Linux system, its commands, files & directories, system, shell programming, PERL programming and system administration. After the completion of this course, student will be able to:

- Work in the Linux environment for Linux server administration
- Write the shell programs, PERL programs and C-program with system calls

- Note:**
- (i) The Question Paper will consist of Four Units.
  - (ii) Examiner will set total of **NINE** questions comprising **TWO** questions from each Unit and **ONE** compulsory question of short answer type covering whole syllabi.
  - (iii) The students are required to attempt **ONE** question from each Unit and the Compulsory question.
  - (iv) All questions carry equal marks unless specified.

## UNIT-I

1. **Introduction to Linux:** Functions of an operating system, Linux's History, different flavors of Linux, Minimum System Requirements for installing Linux: Using LILO; Linux's fdisk.
2. **Using Linux:** Starting and Stopping your Linux System, Linux Shutdown Commands, Login, Passwords; Linux Error Messages, Search Paths, Input and Output Redirection, Man pages, Wildcards: \* and ?, Environment Variables, process Commands: ps, kill, su command; GREP pattern searching command, vi text-editor.

## UNIT-II

3. **Using the File System** : Files Overview, Common types of files, file and directory management commands, Absolute and relative filenames; pwd, cd, rm, cat, mkdir, mv, cp,, Important directories in the Linux file System: /, /home, /bin, /usr, /usr/bin, /usr/spool, /dev, /usr/bin, /sbin, /etc.
4. **File and Directory Permissions** : File and Directory ownership, User and ownership, Groups, Changing group ownership, File Permissions, UMASK Setting, Changing File Permission, Changing directory permissions; Bourne Again Shell (BASH): Command-line Completion, Wildcards, Command History, Aliases, Pipelines, setting shell prompts, Job control, Customizing bash, bash variables.

## UNIT-III

5. **Shell Programming**: Creating and Running Shell Programs, Using variables, Positional Parameters and other built-in Shell Variables; importance of quotation marks, test Command, Conditional Statements: if Statement, case Statement; Iteration Statements: for Statement, while Statement, until Statement, shift Command, select Statement, repeat Statement, Functions.
6. **Linux for System Administrators**: System Administration Basics, The root Account, Starting and Stopping the System; Mounting File Systems: Mounting a Device, Creating a New file System, Un-mounting file Systems, Checking file Systems, Compressing files with gzip and compress: Using tar, Backups, Setting the Login Message, Setting of DNS, Ping, WWW, and e-mail.

## UNIT-IV

7. **PERL**: Creating and Executing Perl Programs, Handling Data in Perl: Variables, Numbers, Strings, File Operators: Arrays, Perl Programming Constructs: Statement Blocks, If Statements, unless Statements, for Statements, for each Statements, while Statements, until Statements, Functions: Passing Arguments to Functions, Using Return Values; Perl Operators.
8. **System Calls**: C as System Programming Language, I/O system calls – umask(); create(); open(); read(); write(); lseek(); dup(); link(); access(); chmod(); chown(); Process management system calls; fork(); getpid(); getppid(); exit(); wait(); sleep(); Signal system calls – kill(); signal().

# SYLLABUS

## B.A. 3<sup>rd</sup> Year (INFORMATION TECHNOLOGY) Paper-VIII: LINUX OPERATING SYSTEM

Total Periods (3 Periods/week): 120

Max Marks: 55

Exam Hours: 3

**Objective:** The objective of the module is to familiarize the students with Linux Operating System.

- Note :**
- (i) The Question Paper will consist of Four Sections.
  - (ii) Examiner will set total of NINE questions comprising TWO questions from each Section and ONE compulsory question of short answer type covering whole syllabi.
  - (iii) The students are required to attempt ONE question from each Section and the Compulsory question.
  - (iv) All questions carry equal marks unless specified.

### SECTION-A

**Introduction to Operating Systems,** its need and services, Simple Batch systems, Multi-programmed batched systems, Time sharing systems, Parallel systems, distributed systems and real time systems.

**Introduction to Linux:** What is Linux, Linux's History, Minimum System Requirements; Installing Linux : Working with Linux, Floppy-less Installation, Boot and Root Disks, Choosing Text or Graphics Installation, Setting up your Hard Drive, Formatting the Partitions, Setting up the Ethernet, Configuration X, Selecting packages to Install, Using LILO; Partitioning the Hard Disk : Linux Swap Space Partitions, Linux's fdisk, Enabling the Swap Space for Installation, Creating the Linux File-system partition, Using LILO

**Using Linux:** Starting and Stopping your Linux System, Linux Shutdown Commands, Login, Passwords, Creating a New Login, Logging Out; Trying out your new Login : Linux Error Messages, Search Paths; The who Command, Commands and Programs.

### SECTION-B

**Basic Linux Commands:** How Linux Commands Work, Command Options, Other Parameters, Input and Output Redirection, National conventions used to Describe Linux commands, Online help available in Linux, The Linux Man pages, Finding keywords in Man pages, The bash shell help facility; Wildcards : \* and ?, Environment Variables, Process and How to Terminate them, The process status Commands : ps, The process termination command : kill, Becoming someone else, the su command, the grep command.

**Using the File System :** Files Overview, Common types of files, filenames, Directories an Overview, Parent directories and sub-directories, The root directory, How directories are named, The home directory; Navigating the Linux file System : pwd command, Absolute and relative filenames; cd command, Creating and Deleting files : Cat, Creating Directories, Moving and Copying files, Moving and Copying with Wildcards, Moving Directories, Removing files and directories, Fear of Compression: The Zipless file, Important directories in the Linux file System : /, /home, /bin, /usr, /usr/bin, /usr/spool, /dev, /usr/bin, /sbin, /etc.

**File and Directory Permissions:** File and Directory ownership, User and ownership, Groups, Changing group ownership, File Permissions, UMASK Setting, Changing File Permission, Changing directory permissions; Bash : What is Shell ? How the Shell gets Started, The most common Shells; The Bourne Again Shell : Command-line Completion, Wildcards, Command History, Aliases, Input Redirection, Output Redirection, Pipelines Shell, Prompts, Job control, Customizing bash, bash commands, bash variables.

## SECTION-C

**Linux - tcsh:** An Introduction to tcsh, Command completion, Wildcards, Command History, Aliases, Input and Output Redirection, Pipelines, Prompts, Job Control; Key Bindings, Correcting Spelling Errors, Pre-commands, Change directory Commands, Monitoring Logins and Logouts, Customizing tcsh, tcsh Command Summary, tcsh variables.

**Shell Programming:** Creating and Running Shell Programs, Using variables : Assigning a value to a variable, Accessing the value of a variable, Positional Parameters and other Built-In Shell Variables; The Importance of Quotation Marks : The test Command, The tcsh Equivalent of the test command, Conditional Statements : if Statement, case Statement; Iteration Statements : for Statement, while Statement, until Statement, 'shift Command, select Statement, repeat Statement, Functions.

**Editing and Typesetting:** Text Editors vi, The vi Editor, Starting vi, vi modes, Inserting Text, Quitting vi, Moving the Cursor, Deleting Text, Copying and Moving Text, Searching and Replacing Text, Setting Preferences.

## SECTION-D

**Linux for System Administrators:** System Administration Basics, The root Account, Starting and Stopping the System, Booting from a Floppy, Using LILO to Boot, Shutting Down Linux; Mounting File Systems : Mounting a Floppy, Creating a New file System, Un-mounting file Systems, Checking file Systems, Using a file as Swap Space; Compressing files with gzip and compress : Using tar, Backups, Setting up your System : Setting the System Name, Using a Maintenance Disk, Forgetting the root Password, Setting the Login Message.

**Networking & Network Services :** What is TCP/IP ? Hardware Requirements, Configuring Linux Files, Setting up the Dummy Interface, Configuration Files, Testing and Troubleshooting, The netstat Command, ping, Mail, News, NFS, NIS, www, FTP, DNS.