

## Course Outline

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### LPI 101

**Duration:** 5 days (30 hours)

**Learning Objectives:**

- Everything you need to know to prepare for the LPI 101 exam
- All the key core elements of the Linux operating system installation, file system, RPMs, network configuration, backup, restore, X Window, Kernel configuration, application management
- The core Internet related technologies- e-mail, security, DNS, Apache, Squid

**Target Audience:**

- Anyone interested in gaining a greater understanding of Linux
- Anyone responsible for providing basic installation, operation, and troubleshooting services on Linux workstations and servers
- Microsoft professionals seeking to add Linux expertise

**Prerequisites:**

No Prerequisites

**Topics Covered:**

- Linux Fundamentals
  - Objectives
  - What is Linux
  - The Story of Linux
  - The Free Software Model
  - Linux Features
  - Loadable Device Modules
  - GUI Window Managers
  - Programming Languages
  - Linux Advantages
  - GUI is Not Necessary
  - Remote Administration is Easy
  - Rebooting is Uncommon
  - Viruses are Rare
  - Linux Limitations
  - Linux Distribution Mechanism
  - Linux Standards
  - FHS and LSB
  - Linux Documentation
  - The Linux Documentation Project



- System Administration
- Operational vs. Administrative
- Labs & Self-Directed Exercises
- Installing a Linux System
  - Objectives
  - Installation Options
  - Getting Ready- System Type
  - Types of Servers and Workstations
  - Linux PRE-Installation
  - Creating a Boot Floppy
  - Drive Partitions
  - Preparing Your System to Dual-Boot
  - Partition the Drive
  - Other Partitioning Methods
  - Linux Boot Loaders
  - X Window System Installation
  - System Initialization
  - Boot Sequence- Init and / etc/inittab
  - Labs & Self-Directed Exercises
- Linux Usage
  - Objectives
  - Command Line Basics
  - Common Commands
  - File System Basics
  - The Linux File System
  - Navigating the Directory Tree
  - Permissions
  - Copying, Moving & Removing Files
  - Creating, and Deleting Directories
  - Interpreting Files
  - Linux Text Editors
  - Basic vi
  - Vi Modes
  - The Linux Shell
  - Profiles
  - Environment
  - Using the bash Shell
  - Redirecting Input and Output
  - Background Jobs
  - Bash Scripting
  - Labs & Self-Directed Exercises
- Linux System Background
  - Objectives
  - Hardware and Architecture

- System Resources
- IRQ
- I/O Addresses
- DMA
- Devices and Drivers
- Hard Drives
- Network Interface Controllers
- Adding RAM
- Modems
- Audio Controllers
- The Linux File System
- Which File System is Best?
- File System Structure
- Directory Hierarchy
- File-related Commands
- Windows NT-and Linux File Permissions
- Permissions and Ownership in a GUI
- Mounting File Systems
- Managing Shared Libraries
- Process Management
- The /proc File System
- Labs & Self-Directed Exercises
- Administration Utilities
  - Objectives
  - Online Documentation
  - man Pages
  - Manual Entries
  - Linux Documentation Project
  - System Information
  - Identifying the System
  - System Default Files
  - Identifying and Communicating with Active Users
  - Finding Files
  - The Find Command
  - The Locate Command
  - Locating Commands
  - Interpreting Files
  - Text Processing
  - The grep Family
  - Regular Expressions
  - Filters
  - Sed
  - Labs & Self-Directed Exercises
- Files and Directories

- Objectives
- Standard Directories
- Linux File System
- Long Directory Listing
- Access Control
- File and Directory Permission
- File Manipulation Permissions
- Set User and Group Ids
- The Sticky Bit
- File Permission Commands
- Links
- Hard Link
- Symbolic Link
- Labs
- Processes
  - Objectives
  - Processes
  - The Linux Kernel
  - Programs and Processes
  - Daemons and Zombies
  - Key Attributes of a Process
  - Running Processes
  - Checking on Processes
  - The /proc File System
  - Signals
  - Sending Signals
  - Intercepting Signals
  - Scheduling Processes
  - The at Command
  - Listing and Deleting at Jobs
  - The crontab Command
  - Administering at and crontab
  - Labs & Self-Directed Exercises
- System Startup and Shutdown
  - Objectives
  - Standard Boot Process
  - Typical lilo.conf
  - Boot Problems
  - Manual Boot
  - Startup Flow Control
  - Run Levels
  - The init Control File: /etc/inittab
  - Run Command Scripts (System V)
  - rc Script Details (System V)

- Changing Run Levels
- Shutting Down
- Maintenance Mode
- Labs
- Managing Users
  - Objectives
  - Creating New User Accounts
  - New User Requirements
  - Preparing Groups
  - The /etc/passwd File
  - Allocating User IDs
  - Adding/Removing Users
  - Changing User Attributes
  - Changing Group Membership
  - Security
  - Setting Passwords
  - Choosing Passwords
  - The /etc/Shadow File
  - Account Security
  - Labs
- User Environments
  - Objectives
  - Login Shell
  - Restricted root Access
  - Environment Files
  - Environment Definitions
  - The unmask Command
  - Security Issues
  - Message of the Day (motd)
  - Guest Accounts
  - Shared Accounts
  - Shared Group Directories
  - Labs
- File Systems
  - Objectives
  - File System Structure
  - File System Types
  - Making a File System
  - Mounting a File System
  - Kernel File Cache
  - The lost+found Directory
  - Corrupt File Systems
  - Identifying Lost Files
  - File System Configuration File

- Utilities
- Free Disk
- Disk Usage
- Quota
- User Disk Quota
- Getting a Report on a User's Quota Status
- Turning on Quota at Boot Time
- Maintaining Quota
- Labs & Self-Directed Exercises
- Backup and Restore
  - Objectives
  - Why Perform Backups
  - When to Backup
  - Where to Store Backups
  - What to Backup
  - Backup Media
  - Magnetic Tape
  - Optical Disks
  - Removable Disks
  - Backup Utilities
- Linux Backup Terminology
  - Tape Archive and Restore
  - Copy to I/O
  - Using cpio
  - Direct Device Access
  - Using dd to identify a File Type
  - Using Compression and dd
  - Handling Tapes with mt
  - Linux Tape Device Names
  - Working with MS-DOS Diskettes
  - Network Backups
  - Labs & Self-Directed Exercises
- Security, Monitoring, and Troubleshooting
  - Objectives
  - Your Role in Security
  - Physical Security
  - Software Security
  - Exploits
  - Security Tools
  - Basic NFS Security
  - Security and NFS
  - Client Security
  - X Windows Security
  - Monitoring System Performance

- What to Monitor
- CPU Process Reporter (top)
- Monitoring Memory Usage
- Virtual Memory Usage
- /proc/ meminfo
- Other Utilities
- Monitoring Log Files
- Inspecting Log Files
- Remote Logging
- Troubleshooting
- Preparing for Trouble
- Potential Installation Problems
- LILO Error Messages
- Printing Troubleshooting
- Repairing File Systems
- Mail System Maintenance
- Emergency Booting
- Hardware vs. IRQ Problems
- Problems with SCSI Controllers and Devices
- Setting Your System's Clock
- Troubleshooting Routing Issues
- Labs