

This 5-day course focuses on the fundamental tools and concepts of Linux and UNIX. Students gain proficiency using the command line. Beginners develop a solid foundation in UNIX, while advanced users discover patterns and fill in gaps in their knowledge. The course material is designed to provide extensive hands-on experience. Topics include: basic file manipulation; basic and advanced file system features; I/O redirection and pipes; text manipulation and regular expressions; managing jobs and processes; vi, the standard UNIX editor; automating tasks with shell scripts; managing software; secure remote administration; and more.

Course Objectives:

- Identify multi-user concepts
- Perform archiving and compression
- Create shell scripts
- Identify the Linux File System
- Perform text processing
- Identify command shells

Audience: Students should be comfortable with computers.

Prerequisites: No familiarity with Linux or other UNIX operating systems is required.

Number of Days: 5 days

<p>1</p>	<p>What is Linux? UNIX Origins and Design Principles UNIX Timeline FSF and GNU GPL - General Public License The Linux Kernel and Versioning Components of a Distribution Slackware SUSE Linux Products Debian Ubuntu Red Hat Linux Products Oracle Linux Mandriva</p>		<p>got root? Switching User Contexts sudo Help from Commands and Documentation Getting Help with man & info</p>
<p>2</p>	<p>Login and Exploration Logging In Running Programs Interacting with Command Line The X Window System Starting X Gathering Login Session Info Gathering System Info</p>	<p>3</p>	<p>The Linux FileSystem Filesystem Support Unix/Linux Filesystem Features Filesystem Hierarchy Standard Navigating the Filesystem Displaying Directory Contents Filesystem Structures Determining Disk Usage With df and du Determining Disk Usage with baobab Disk Usage with Quotas File Ownership Default Group Ownership File and Directory Permissions File Creation Permissions with umask Changing File Permissions SUID and SGID on files</p>

	SGID and Sticky Bit on Directories	8	Regular Expressions
	User Private Group Scheme		Regular Expression Overview
4	Manipulating Files		Regular Expressions
	Directory Manipulation		RE Character Classes
	File Manipulation		RE Quantifiers
	Deleting and Creating Files		RE Parenthesis
	Physical UNIX File Structure	9	Text Editing
	Filesystem Links		Text Editing
	File Extensions and Content		Pico/GNU Nano
	Displaying Files		Pico/Nano Interface
	Previewing Files		Pico/Nano Shortcuts
	Displaying Binary Files		vi and Vim
	Searching the Filesystem		Learning vi
	Alternate Search Method		Basic vi
	Producing File Statistics		Intermediate vi
5	Shell Basics	10	Command Shells
	Role of Command Shell		Shells
	Communication Channels		Identifying the Shell
	File Redirection		Changing the Shell
	Piping Commands Together		Bourne sh: Configuration Files
	Filename Matching		Script Execution
	File Globbing and Wildcard Patterns		Bourne sh: Prompts
	Brace Expansion		bash: Bourne-Again Shell
	Shell and Environment Variables		bash: Configuration Files
	Key Environment Variables		bash: Command Line History
	General Quoting Rules		bash: Command Editing
	Nesting Commands		bash: Command Completion
	Multiple and Multi-line Commands		bash: "shortcuts"
6	Archiving and Compression		bash: prompt
	Archives with tar		Setting Resource Limits via ulimit
	Archives with cpio	11	Introduction to Shell Scripting
	The gzip Compression Utility		Shell Script Strengths and Weaknesses
	The bzip2 Compression Utility		Example Shell Script
	The XZ Compression Utility		Positional Parameters
	The PKZIP Archiving/Compression format		Input & Output
7	Text Processing		Doing Math
	Searching Inside Files		Comparisons with test
	The Streaming Editor		Exit Status
	Text Processing with awk		Conditional Statements
	Replacing Text Characters		Flow Control: case
	Text Sorting		The for Loop
	Duplicate Removal Utility		The while and until Loops
	Extracting Columns of Text	12	Process Management and Job Control
	Combining Files and Merging Text		What is a Process?
	Comparing File Changes		Process Lifecycle
			Process States

	Viewing Processes		
	Signals		
	Tools to Send Signals		
	Job Control Overview		
	Job Control Commands		
	Persistent Shell Sessions with Screen		
	Using screen		
	Advanced Screen		
13	Process Administration	16	Printing
	Automating Tasks		Linux Printer Sub-systems
	at/batch		Legacy Print Systems
	cron		Common UNIX Printing System
	The crontab Command		Defining a Printer
	Crontab Format		Standard Print Commands
	/etc/cron.*/Directories		Format Conversion Utilities
	Anacron		Ghostscript
	Managing Processes		enscript and mpage
	Tuning Process Scheduling	17	The Secure Shell (SSH)
14	Managing Software		Secure Shell
	Downloading with FTP		ssh and sshd Configuration
	FTP		Accessing Remote Shells
	lftp		Transferring Files
	Command Line Internet - Non-interactive		Alternative sftp Clients
	Command Line Internet - Interactive		SSH Key Management
	Managing Software Dependencies		ssh-agent
	Using the YUM command	18	Mounting FileSystems & Managing Removable Media
	YUM package groups		Filesystems Concept Review
	Configuring YUM		Mounting Filesystems
	Popular Yum Repositories		NFS
	Using the Zypper command		SMB
	Zypper Services and Catalogs		Filesystem Table (/etc/fstab)
	The dselect & APT Frontends to dpkg		AutoFS
	Aptitude		Removable Media
	Configuring APT		Appendix A – The X Window System
15	Messaging		The X Window System
	System Messaging Commands		X Modularity
	Controlling System Messaging		X.Org Drivers
	Internet Relay Chat		Configuring X Manually
	Instant Messenger Clients		Automatic X Configuration
	Electronic Mail		Automatic X Configuration - SLES
	Sending Email with sendmail		Xorg and Fonts
	Sending and Receiving Email with mailx		Installing Fonts for Modern Applications
	Sending and Receiving Email with mutt		Installing Fonts for Legacy Applications
	Sending Email with Pine		The X11 Protocol and Display Names
	Evolution		Display Managers and Graphical Login
			Starting X Apps Automatically
			X Access Control
			Remote X Access (historical/insecure approach)
			Remote X Access (modern/secure approach)
			XDMCP

Remote Graphical Access With VNC
and RDP
Specialized X Servers

Appendix B - EMACS

Emacs
The Emacs Interface
Basic Emacs
More Emacs Commands