



**GUJARAT TECHNOLOGICAL UNIVERSITY**

**Bachelor of Vocation (B.Voc)**

**Semester: III**

**Branch: Software Development**

**Subject Name: Linux Operating System-Operations and Management**

**Subject Code: 21130201**

**Type of course:** Core

**Prerequisite:** Operating Systems

**Rationale:** The purpose of this subject is to cover the concepts, Installation Process, Hardware Requirements and features of Unix/Linux, Basic Commands and Shell Programming. This subject also covers system administration and basic networking administration in Linux.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	0	3	50	0	0	0	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

**Content:**

Sr. No.	Practical / Hands on Exercise	Hrs.	Weightage
1.	<b>UNIT-I</b> <b>Linux Introduction and file system:</b> - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, why use linux?. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, echo, cal, date, clear, cat, cut, more, less, creating and viewing files, file comparisons, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System start up and shut-down, Introduction of different Linux operating systems	08	20
2.	<b>UNIT-II</b> <b>Essential Linux commands:</b> Understanding shells, Processes in Linux process fundamentals, connecting processes with pipes, redirecting input output, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, Basic commands: Sudo, pwd, passwd, batch commands, kill, ps, who, sleep, Printing commands, grape, fgrep, find, head, tail, find, history, sort, banner, touch, file, file related commands-ws, sat, cut, grep, dd, chmod. Mathematical commands- bc, expr, factor, units. vi, joe, vim editor	08	20



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<b>3.</b>	<b>UNIT-III</b> <b>Shell programming:</b> Basic of shell programming, Various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grep in shell	08	20
<b>4.</b>	<b>UNIT-IV</b> <b>System administration:</b> Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user’s accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su. Getting system information - host name, disk partitions & sizes, users, kernel.  Backup and restore files, linuxconf. Utility in GUI, reconfiguration hardware with kudzu Configure desktop-X configurator, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.	10	20
<b>5.</b>	<b>UNIT-V</b> <b>Basic networking administration:</b> Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment, common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands a TCP/IP networks, DNS services, routing using Linux, SLIP & PPP services, UUCP. Installation & Administration of mail server, ftp server and Apache web server.	08	20
	<b>Total</b>	<b>42</b>	

**Reference Books:**

1. Linux Complete Reference - Richard Peterson, TMH
2. UNIX – Concepts & Applications (Third Ed.) – Sumitabha Das, Tata McGraw Hill Publications.
3. Unix for programmers and users (Third Ed.) – Graham Glass & King Ables, Pearson Education India. (Low Prices Edition).
4. Linux Kernel, Beck Pearson Education, Asia
5. Red Hat Linux 9 Bible – Cristopher Negus, IDG Books India Ltd.
6. Y. Kanetkar “Unix shell programming”, BPB Pub.



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**Suggested Specification Table with Marks (Theory):**

<b>Distribution of Theory Marks</b>					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	0	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

**Course Outcomes:**

**CO1:** Recognize Understand Linux features and its file system.

**CO2:** Understand demonstration Linux processing system and process fundamentals

**CO3:** To Apply programming skills in Shell.

**CO4:** Understand system administration in Linux

**CO5:** Understand basic networking administration

**Laboratory work: NA**

**List of Open Source Software/learning website:**

Students must refer to following sites to enhance their learning ability.

- 1) Vlabs.iitb.ac.in
- 2) NPTEL tutorials
- 3) <https://www.edx.org/learn/linux>
- 4) <https://opensource.com/resources/linux>