

**UNIT-I-HISTORY AND OVERVIEW OF GNU/LINUX AND FOSS****3**

Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential— global and Indian.

**UNIT-II SYSTEM ADMINISTRATION****10**

GNU/Linux OS installation--detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands -logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line) ; Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities--configure X windows, detect display devices ; Installing software from source code as well as using binary packages

**UNIT-III SERVER SETUP AND CONFIGURATION****10**

Setting up email servers--using postfix ( SMTP services), courier ( IMAP & POP3 services), squirrel mail ( web mail services) ; Setting up web servers --using apache ( HTTP services), php (server-side scripting), perl ( CGI support) ; Setting up file services --using samba ( file and authentication services for windows networks), using NFS ( file services for gnu/Linux / Unix networks) ; Setting up proxy services --using squid ( http / ftp / https proxy services) ; Setting up printer services -using CUPS (print spooler), foomatic (printer database) ; Setting up a firewall -Using netfilter and iptables

**UNIT-IV PROGRAMMING TOOLS****12**

Using the GNU Compiler Collection --GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems --constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools --using cvs to manage source code revisions, patch & diff ; Understanding the GNU Libc libraries and linker -linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools --gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash,

sed & awk scripting

**UNIT-V APPLICATION PROGRAMMING**

**10**

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

**TOTAL: 45 PERIODS**

**REFERENCES:**

- 1 N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
- 2 Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
- 3 Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004.

**On-line material**

1. Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN: 1-56592-582-3. URL: [http://www.oreilly.com/catalog/ opensources /book/toc.html](http://www.oreilly.com/catalog/opensources/book/toc.html)
2. The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001. URL: [http://dsl.org/cookbook/cookbook\\_toc.html](http://dsl.org/cookbook/cookbook_toc.html)
3. The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: <http://www.tldp.org/guides.html>
4. Using GCC, Richard Stallman et al. URL: <http://www.gnu.org/doc/using.html>
5. An Introduction to GCC, Brian Gough. URL: <http://www.network-theory.co.uk/docs/gccintro/>
6. GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: <http://sources.redhat.com/autobook/>
7. Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL: <http://cvsbook.red-bean.com/>
8. Advanced Bash Scripting Guide, Mendel Cooper, June 2005. URL: <http://www.tldp.org/guides.html>
9. GTK+/GNOME Application Development, Havoc Pennington. URL: <http://developer.gnome.org/doc/GGAD>
10. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: <http://www.python.org/doc/current/tut/tut.html>