AMITY UNIVERSITY
UTTAR PRADESH

Course Title: Open Source Server Management
Course Code: CSIT716
Course Level: PG
Credit Units: 04

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	-	2	-	4

Course Objectives: The main objectives of the course are as follows:

- To provide a detailed knowledge of working of Open Source Server Management.
- Recognize basic operations by means of commands, and gradually involves Open Source System Administration and Network Administration Concepts.
- To provide essential knowledge of working of Open Source Operating Systems along with Managing and maintaining various server and client machines in a network environment.

Pre-requisites: Basic understanding of Operating Systems, Installation and Configuration of Client and Server machines.

Course Contents/Syllabus:

	Weightage (%)
Module I Installation and Boot process	**15**
Linux Installation & Basic Commands: Introduction to OS, Understanding Red Hat Linux Installation Basic Commands (cal , ls, cp mv etc), Editors (vi & ed), Redirection & piping, Filters Linux utilities: grep, etc., Shells (C & Bourne, Korne, R Shell), Variables, Script, Metacharacters & Environment variable, concating command, indirection, redirection, foreground and background process. The Boot Process: Virtual Consoles, The Boot Process, Kernel Initialization, init and /etc/inittab, Exploration of the, init Process, The GRUB Boot Loader.	
Module II File System and User Administration	**15**
Filesystem and Software Administration: Partitioning Utilities, Journaling Filesystems, Formatting Filesystems, mount, The Automounter/etc/fstab, Red Hat Network Implementation, Maintaining Software with RPM, Performing RPM Queries, RPM	

Related Utilities, User Administration: PAM, Creating User Accounts, Maintaining User Accounts, Creating/Maintaining Groups, The User Private Group Model, SGID Directories, The Initial User Environment, Configuring Quotas NIS Server and Client Configuration.	
Module III System Administration Tools and Kernel Services	**15**
System Administration Tools: Installing with Kickstart, cron Scheduling, Daily cron Scripts, Network Interface Configuration, CUPS Configuration and Administration, LPRng Configuration and Administration, syslog Configuration, Kernel Services and Configuration: Linux LVM Configuration and Administration, Managing Kernel Modules, Examining and Setting Kernel Parameters in /proc, Software RAID Configuration and Recovery.	
Module IV Open Source Software Configuration	**15**
Apache and Squid: Squid Proxy Server Overview, Apache Configuration, Implementing Apache Virtual Hosts, NFS and Samba, Configuring an NFS Server, Samba Client Tools, Samba Server Configuration, Windows Passwords and Samba, Sharing Files, Directories and Printers with Samba.	
Module V Open Source Management	**15**
DNS and Electronic Mail: Sendmail Configuration Files, Macro Language and the sendmail.mc File, Additional sendmail Configuration Files, Postfix Configuration Files, Configuring BIND, named.conf, Configuring Forward and Reverse Lookup Zones, Special Zones, Zone Files.FTP, xinetd, and OpenSSH: vsftpd Configuration, DHCP Server Configuration, OpenSSH Client Utilities, OpenSSH Server Configuration, OpenSSH Authentication Methods, xinetd.conf, xinetd Service Files.	
Module VI X Windows System	**15**
The X Window System: Configuring XFree86, The X Protocol Overview, X Protocol Network Transparency, X Window System and ssh, Window Managers, Display Managers, X Window System Security, X Window System Modularity, XFree86 Startup, The X Font Server. Securing Services: tcp wrappers Configuration, netfilter Configuration, Maintaining netfilter Rules, netfilter Example netfilter Network Address Translation, netfilter Connection Tracking.	
Module VII Troubleshooting	**10**
Troubleshooting: Filesytem Corruption, Filesytem Recovery, Things to Check: The X Window System, Things to Check: Services, Things to Check: Networking, Things to Check: Booting, The Rescue Environment, Recovery Runlevels, Boot Floppies.	

Student Learning Outcomes: Upon completion of the course, students shall be able to:

- Explain the concepts and principles in Open Source Server Administration.
- Communicate and operate the Open Source Operating System and its graphical user interface.
- Maintain file systems and system resources of server and client machines.
- Install and administrate different Open Source web servers like Apache, Squid and SAMBA.

Pedagogy for Course Delivery:

- Classroom Lecture method is used and along with it, as and when required, it shall be supplemented with various appropriate audio-visual aids.
- Practical Lab will be used that equipped with Open source Servers, software and networking environment.

Lab/ Practicals details, if applicable:

List of Experiments:

SNo	Lab Exercise- Name	Lab Exercise -Details
1	Hardware, Device Configuration and Installation of Linux	Steps wise - How to Install Linux
2	System Initialization and Services	Exploring Linux Console Configuration GUI Configuration Modifying User Environments Exploring File system Using Utilities to Manage Files
3	User Administration	Creating/ Deleting new User Accounts Modifying User accounts Managing Files and Directories
4	Network Configuration	DNS Configuration Network Configuration Utilities Configuring the Internet Settings Network Diagnostics

5	Printing and Administration Tools	Printer Configuration tool Networked CUPS (Common Linux Printing System) overview Networked Linux (LPD)
6	DCHP Administration	DHCP Server Configuration DHCP Client Configuration
7	System Backup	Backup Administration
8	RPM and Boot loaders	RPM Package Manager Adding and Removing Software MultiBoot systems
9	SAMBA Server/Client Administration	File and Print sharing from Linux to Windows Network Windows (SMB)
10	NFS Server/Client Setup	Allow to share directories between Linux Systems
11	Apache Web Server Administration	Apache Server Configuration Basic settings Virtual Hosting
12	Squid Proxy server Administration	Basic Settings File Squid.conf Configuration
13	Mail Server Administration	Mail Server configuration POP3 Server IMAP Server
14	The X Window System	Configuration Utilities
15	Troubleshooting	Things to check: Services Things to check: Networking File System Recovery Rescue Environment utilities

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total (%)
75	**25**	**100**

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	**Attendance**	**Mid Term**	**Presentation**	**Viva**	
Weightage (%)	05	10	10	05	70

Lab/ Practical/ Studio Assessment:

	Continuous Assessment/Internal Assessment					End Term Examination		
Components (Drop down	**Viva**	**Mid Term**	**Lab Record**	**Performance**	**Attendance**	**Practical Evaluation**	**Viva**	**Total**
Weightage (%)	05	10	10	10	05	40	20	60

Text:

- Evi Nemeth, Unix and Linux System Administration Handbook, Pearson Education, 4th Edition, 2010.
- Tom Adelstein, Bill Lubanovic, Linux System Administration, O'Reilly Media, 1st Edition, 2007.
- Bernard Golden, Open Source in Enterprise, O'Reilly Media, 1st Edition, 2009.
- Karl Franz Fogel, Producing Open Source Software: How to Run a Successful Free Software Project, O'Reilly Media, 1st Edition, 2005.

References:

- Sumitabha Das, Unix Concept and Applications, Tata McGraw Hill, 3rd Edition, 2006.
- Yashwant Kanetkar, Unix Shell Programming, BPB Publications, 2nd Edition, 2003.
- Vicki Stanfield, Roderick W. Smith, Linux System Administration, Wiley / Sybex, 2nd Edition, 2006.

Web References:

- http://www.linux.org/
- http://opensource.org/