

Course Title: Network and System Administration

Course no: CSC-407

Full Marks: 60+20+20

Credit hours: 3

Pass Marks: 24+8+8

Nature of course: Theory (4 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Provides the concept of network and system administration

Goal: The class concentrates on the network and system administration, and covers subjects ranging from initial installation of OS to day-to-day administrative tasks such as Network and Server Configurations, management of user accounts and disk space, and even imparting the troubleshooting skills future system administrators will need to cope with unexpected behaviour.

Course Contents:

1 Networking Overview

4Hrs.

- 1.1 History
- 1.2 Protocol Standards
- 1.3 Reference Model (OSI, TCP/IP)
- 1.4 Windows and Linux Networking Basics
- 1.5 Switching and Routing basics

2 Server Administration Basics

6Hrs.

- 2.1 Server and Client Installation
- 2.2 Boot Process and Startup Services: Xinetd/Inetd
- 2.3 Managing accounts: users, groups and other privileges
- 2.4 File Systems and Quota Management
- 2.5 Job Scheduling with cron, crontab, anacron and system log analysis
- 2.6 Process controlling and management
- 2.7 Online Server upgrade/update process
- 2.8 Administering Database Server (MySQL)

3 Network Configuration Basics

4Hrs.

- 3.1 IPv4 and IPv6 addressing
- 3.2 Network Interface Configuration
- 3.3 Diagnosing Network startup issues
- 3.4 Linux and Windows Firewall configuration
- 3.5 Network troubleshooting commands

4 Dynamic Host Configuration Protocol (DHCP)

4Hrs.

- 4.1 DHCP Principle
- 4.2 DHCP Server Configuration
- 4.3 DHCP Options, Scope, Reservation and Relaying
- 4.4 DHCP Troubleshooting

5 Name Server and Configuration 6Hrs.

- 5.1 DNS principles and Operations
- 5.2 Basic Name Server and Client Configuration
- 5.3 Caching Only name server
- 5.4 Primary and Slave Name Server
- 5.5 DNS Zone Transfers
- 5.6 DNS Dynamic Updates
- 5.7 DNS Delegation
- 5.8 DNS Server Security
- 5.9 Troubleshooting

6 Web and Proxy Server Configuration 6Hrs.

- 6.1 HTTP Server Configuration Basics
- 6.2 Virtual Hosting
- 6.3 HTTP Caching
- 6.4 Proxy Caching Server Configuration
- 6.5 Proxy ACL
- 6.6 Proxy-Authentication Mechanisms
- 6.7 Troubleshooting

7 FTP, File and Print Server 5Hrs.

- 7.1 General Samba Configuration
- 7.2 SAMBA SWAT
- 7.3 NFS and NFS Client Configuration
- 7.4 CUPS configuration basics
- 7.5 FTP Principles
- 7.6 Anonymous FTP Server
- 7.7 Troubleshooting

8 Mail Server basics 6Hrs.

- 8.1 SMTP, POP and IMAP principles
- 8.2 SMTP Relaying Principles
- 8.3 Mail Domain Administration
- 8.4 Basic Mail Server Configuration (Sendmail, postfix, qmail, exim..)
- 8.5 SPAM control and Filtering
- 8.6 Troubleshooting

9 Remote Administration and Management 4hrs.

- 9.1 Router Configuration
- 9.2 Webmin/usermin
- 9.3 Team Viewer
- 9.4 Telnet
- 9.5 SSH
- 9.6 SCP, Rsync

Laboratory work: All the features of this course

Samples:

1. Server/Client Installation over VMware Environment
2. Packet Analysis by using TCPDUMP and WIRESHARK
3. Network Practice with Packet Tracer
4. System Administration: User/Group management, File System Management ...
5. Network Configuration: Start/Stop network Service, network interface configuration
6. Firewall Configuration
7. DNS and DHCP Configuration and Troubleshooting
8. Web and Proxy Server Configuration and Troubleshooting
9. Basic Mail Server Configuration and Troubleshooting
10. SAMBA, NFS, CUPS and FTP configuration and Troubleshooting
11. Webmin/SSH configuration

Reference Book:

1. The Practice of System and Network Administration, Second Edition
Thomas A. Limoncelli, Christina J. Hogan, Strata R. Chalup
2. Advanced Linux Networking, Roderick W. Smith, Addison-Wesley Professional (Pearson Education), 2002.
3. Linux Network Administrator's Guide, Tony Bautts, Terry Dawson, Gregor N. Purdy, O'Reilly, Third Edition, 2005

Prerequisite: Computer Networking Course