

## **Course Name: Linux Server Administration**

### **Course Code: PGDNA121**

#### **Objectives:**

Students will learn

- To understand the basic principles underlying Server Software
- Planning and Deploying Linux Server
- Manage the Servers Efficiently

#### **Prerequisites:**

Fundamentals of Networking, Knowledge of Operating Systems

#### **Contents:**

1. **Linux Server Introduction:** Overview of Linux Distros, Installation & Package Management, File System Management (Partitioning, LVM, RAID)
2. **Network Related Configurations:** Network Interfaces, Network Management & Configurations, Configuring DHCP, Linux Permissions, Controlling Access to Services, Runlevels, Authentication Configuration,
3. **Linux Services:** Open SSH, DNS Services, HTTP Services, FTP Services, Mail Services (Postfix), Proxy Server
4. **System Configurations:** Boot Sequence, Configuring Environment settings, Process Management , Automated Tasks, System logging & Log Files, Archiving

#### **Main Reference Book(s):**

1. Silas D. et al, “Red Hat Enterprise Linux 6 – Deployment Guide”, Online Manual available on redhat.com ([http://docs.redhat.com/docs/en-US/Red\\_Hat\\_Enterprise\\_Linux/6/html/Deployment\\_Guide/index.html](http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/html/Deployment_Guide/index.html))
2. Colligs T., Wall K., “Red Hat Linux Networking & System Administration”, Wiley India
3. Cox K., “Red Hat Linux Administrators Guide”, Prentice Hall India
4. Ambawade D., Shah D., “Linux Lab: Hands on Linux”, Wiley India

#### **Accomplishments of the student after completing the course:**

- Ability to Plan, Deploy and Linux Server
- Ability Monitor and Manage Linux Server.
- Perform the tasks of a Network Administrator.

## **Course Name: Windows Server Administration**

### **Course Code: PGDNA122**

#### **Objectives:**

Students will learn

- To understand the basic principles underlying Server Software
- Planning and Deploying Windows Server
- Manage the Servers Efficiently

#### **Prerequisites:**

Fundamentals of Networking, Knowledge of Operating Systems

1. **Windows Server:** Introduction, Overview of Windows Server, Installation
2. **Windows Network Infrastructure:** Configuring Addressing and Services, Configuring Name Resolution, Configuring Network Access, Monitoring and Managing a Network Infrastructure, Configuring File and Print Services,
3. **Windows Directory Infrastructure:** Overview of Active Directory Infrastructure, Configuring Active Directory Roles and Services.
4. **Windows Application Interface:** Configuring Remote Desktop Services, Configuring Web Service Infrastructure, Configuring Network Application Services.

#### **Main Reference Book(s):**

1. Tulloch et al., “Introducing Windows Server 2012”, Microsoft Press, PHI
2. Minasi M., et al., “Mastering Windows Server 2008 R2”, Wiley
3. Reust D., Reust N., “Microsoft Windows Server 2008: The Complete Reference”, Tata McGrawHill
4. Steve Seguis, “Microsoft Windows 2008 Server Administration”, Tata McGraw Hill
5. Dennis Suhanovs, “MCTS Windows Server 2008 Active Directory Services Study Guide”, Tata McGraw Hill
6. William Panek et al., “MCTS Windows Server 2008 Network Infrastructure Configuration Study Guide: Exam 70-642”, Wiley India  
Joel Stidley, “MCTS Windows Server 2008 Applications Infrastructure Configuration Study Guide”, Wiley India

**Accomplishments of the student after completing the course:**

- Ability to Plan, Deploy and Windows Server
- Ability Monitor and Manage Windows & Linux Server.
- Perform the tasks of a Network Administrator.

**Course Name: Networking – II**

**Course Code: PGDNA123**

**Objectives:**

Students will learn

To understand the state-of-the-art in network protocols, architectures and applications.

To study the functionality of various layers of the OSI model / TCP/IP model and understand the interactions between them.

To develop strong analysis, design, implementation, testing and troubleshooting skills regarding TCP/IP based networks and services.

Design and implement customized TCP/IP based application layer services.

**Prerequisites:**

Fundamentals of Networking

**Contents:**

**1. Data Communication Fundamentals**

Introduction, Bandwidth and Data Rate, Analog and Digital Signaling, Analog and Digital Transmission, Coding mechanisms, Modulation, Modulation in Practice, Multiplexing and De-multiplexing, Time Division Multiplexing, Frequency Division Multiplexing, Switching and Routing, Transmission and Errors.

**2. The Network Layer:**

Classful IP Addresses, IPv6, Classless and Subnet Address Extensions, Address Resolution Protocol, Internet Protocol, Forwarding IP Datagrams, Internet Control Message Protocol, Mobile IP, Private Network Interconnection

**3. The Transport Layer:**

User Datagram Protocol, Reliable Stream Transport Service, Client-Server Model of Interaction, UNIX Socket Interface.

**4. The Application Layer:**

Bootstrap and Auto-Configuration, Domain Name System, Remote Login and Desktop, File Transfer and Access, Electronic mail, World Wide Web.

**5. TCP/IP Networks:**

Performance Measurement and related tools, Network Simulation, Tools provided by the Operating Systems, Network Management (SNMP).

**Main Reference Book(s):**

1. Comer & Douglas. “Internetworking with TCP/IP, Volume 1: Principles, Protocols and Architecture”, 5th Ed., Prentice Hall India (PHI)
2. Hassan M, Jain R., “High Performance TCP/IP Networking: Concepts, Issues and Solution”, Prentice Hall India (PHI)
3. Stevens R. “TCP/IP Illustrated, Volume 1: The Protocols”, Pearson Education.
4. Forouzan B.A., “TCP/IP protocol suite”, Tata McGraw-Hill (TMH).
5. Kurose J., Ross K., “Computer Networking – A Top Down Approach”, Pearson Education
6. Donahoo M., Calvert K., “TCP/IP Sockets in C – Practical Guide for Programmers”, Morgan Kauffman
7. Stevens R., “Unix Network Programming”, Pearson Education
8. Tanenbaum, A.S., “Computer Networks”, Prentice Hall India (PHI)
9. Stallings W., “Computer Networking with Internet Protocols and Technology”, Pearson Education
10. Snader, J., “Effective TCP/IP Programming”, Addison-Wesley
11. Aboelela E., “Network Simulation Experiments Manual”, Morgan Kauffman

**Accomplishments of the student after completing the course:**

At the end of the work student will be able to

Analyze and develop solutions to solve networking problems.

Have thorough understanding of TCP/IP based systems, services and related tools and technologies

Effectively use various tools and utilities for TCP/IP networking.

\*\*\*\*\*    \*\*\*\*\*    \*\*\*\*\*

## **Course Name: Network Security**

### **Course Code: PGDNA124**

#### **Objectives:**

Students will learn

- To understand the basic principles underlying Network Security
- To study various standards and technologies in the area of Network Security
- To study network vulnerabilities and their countermeasures
- Develop abilities in defending Computer Networks

#### **Prerequisites:**

Fundamentals of Networking and Knowledge of Operating System.

#### **Contents:**

##### **1. Introduction**

Overview of Information Security, Security Policies, Standards and Planning, Finding Network Vulnerabilities.

##### **2. Cryptography**

Need of Cryptography, Traditional Cryptography, Symmetric Key Cryptography, Asymmetric Key Cryptography, Overview of PKI.

##### **3. Firewalls**

Planning and Design, Packet Filtering, Working with Proxy Servers and Application-Level Firewalls, Firewall Configuration and Administration.

##### **4. Authentication**

Overview, Firewall Authentication, Centralized Authentication, Password Security, Authentication Systems.

##### **5 Private Networks**

Setting up a Virtual Private Network, Tunneling Protocols used within VPN, Enabling Remote Access Connections within VPN.

##### **6. Intrusion Detection**

Intrusion Detection and Prevention Systems, DMZ, Digital Forensics, Contingency Planning.

**Main Reference Book(s):**

5. Whitman ET. al., “Firewalls and Network Security”, Cengage Learning
6. Maiwald E., “Fundamentals of Network Security”, TMH Publication
7. Stallings W., “Network Security Essentials:- Applications and Standards”, Pearson Education
8. Forouzan B., “Cryptography and Network Security”, TMH Publication
9. Godbole N., “Information Systems Security”, Wiley India Publication
10. Rash M., “Linux Firewalls: Attack Detection And Response With Iptables, Psad, And Fwsnort”, No Starch Press
11. Ghorbani A., Lu W., Tavallaee M., “Network Intrusion Detection and Prevention – Concepts and Techniques”, Springer
12. Turnbull J., “Hardening Linux”, Apress
13. Wouters P., et al., “Building and Integrating Virtual Private Networks with Openswan”, Packt Publishing
14. Feilner M., “OpenVPN – Building and Integrating Virtual Private Networks”, Packt Publishing

**Accomplishments of the student after completing the course:**

At the end of the work student will be able to

- Appreciate the need of Security mechanisms in Computer Networks.
- Ability in Defending Computer Networks.
- Ability in Planning and Designing a Secure Computer Network.

\*\*\*\*\*    \*\*\*\*\*    \*\*\*\*\*

## **Course Name: Practicals – II**

### **Course Code: PGDNA125**

#### **Objectives:**

Students will learn

- To implement network services using MS Windows Server and Linux Server
- To appreciate the use of Shell Scripting for Network Administration
- To prepare a Departmental Server.
- To prepare a Client - Server Network using MS Windows
- To prepare a Client - Server Network using Linux Server

#### **Prerequisites:**

Linux OS, Shell Programming, Fundamentals of Hardware

#### **Contents:**

- 1. Linux Server Installation**
- 2. Management of Linux Server**
- 3. Configuring various network & infrastructure services over Linux Server**
- 4. Configuring security over Linux Server**
- 5. Windows 2008 Server Installation**
- 6. Management of Windows Server**
- 7. Configuring various network & infrastructure services over Windows Server**
- 8. Configuring security over Windows Server**
- 9. Network Security Practicals: Configuration of firewall, IDS/IPS, NMAP, Wireshark, VPN.**

\*\*\*\*\*    \*\*\*\*\*    \*\*\*\*\*