

Diploma in Computer Hardware & Networking (DCHN)

Duration: 9 Months

Course Overview

The **Diploma in Computer Hardware & Networking** is designed to equip students with **comprehensive knowledge and practical skills** in computer hardware, operating systems, troubleshooting, and networking. The course covers everything from **PC assembly and maintenance** to **network setup, configuration, and cybersecurity basics**, along with exposure to **Linux systems, virtualization, and cloud concepts**. Graduates will be ready to work as **Hardware Technicians, IT Support Executives, or Networking Assistants** in various industries.

Course Objectives

1. To introduce students to computer fundamentals and hardware components.
 2. To train students in PC assembly, BIOS/CMOS configuration, and troubleshooting.
 3. To develop proficiency in installing and managing Windows and Linux operating systems.
 4. To provide knowledge of device drivers, software installation, and preventive maintenance.
 5. To build strong fundamentals in **networking concepts, configuration, and troubleshooting**.
 6. To give exposure to **Linux networking commands and administration basics**.
 7. To introduce **cybersecurity awareness and data protection practices**.
 8. To provide introductory knowledge of **virtualization and cloud computing tools**.
 9. To prepare students with **soft skills and career readiness** for the IT support industry.
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Course Outcomes

By the end of the course, students will be able to:

- Explain computer fundamentals, architectures, and components.
- Assemble, configure, and maintain PCs and peripherals.
- Install, configure, and troubleshoot Windows and Linux operating systems.

- Install, update, and manage software and device drivers.
 - Identify, diagnose, and resolve hardware and software problems.
 - Configure and manage small computer networks (wired & wireless).
 - Apply **TCP/IP addressing, subnetting, and sharing techniques**.
 - Use **Linux commands for networking and system administration**.
 - Apply basic cybersecurity principles to protect data and networks.
 - Demonstrate awareness of virtualization and cloud-based computing.
 - Communicate effectively in IT support roles and prepare for career opportunities.
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Course Syllabus

Module 1: Fundamentals of Computers

- History & Generations of Computers
- Classification of Computers (Micro, Mini, Mainframe, Super)
- Hardware, Software, Firmware Concepts
- Number Systems (Binary, Octal, Hexadecimal)
- Data Representation & Coding Systems

Module 2: Personal Computers & Hardware Components

- Desktop, Laptop, and All-in-One PCs
- CPU Architecture & Processors
- Motherboard: Slots, Ports, Chipsets, Buses
- BIOS/UEFI & CMOS Setup
- POST & Beep Codes

Module 3: Memory & Storage Devices

- RAM, ROM, Cache, VRAM
- Hard Disk Drives (HDD), Solid State Drives (SSD), NVMe, M.2
- Optical Storage (CD/DVD/BD)
- Flash Storage & External Drives

Module 4: Input, Output & Add-on Devices

- Input Devices: Keyboard, Mouse, Scanner, MICR, OCR, OMR
- Output Devices: Monitors, Printers, Projectors, Speakers
- Add-on Cards: Graphics, Sound, NIC, TV Tuner, Capture Cards

Module 5: PC Assembly & Configuration

- Tools & Safety Precautions
- Step-by-step Assembly of a PC
- Power Supply & Cabling (SMPS)
- Front Panel & Peripheral Connections
- First Boot & BIOS/UEFI Setup

Module 6: Operating Systems (Windows & Linux)

- File Systems (FAT32, NTFS, EXT4)
- Disk Partitioning & Formatting
- Installing Windows (Step-by-Step)
- Installing Linux (Ubuntu/CentOS Basics)
- Dual Boot Configuration
- Device Drivers Installation
- OS Updates & Patch Management

Module 7: Software & Applications

- Installing & Managing Applications (Office Suites, Multimedia Tools)
- Antivirus & Security Software
- Utility Software & System Tools
- Data Backup & Recovery Tools

Module 8: Printers & Peripherals

- Types of Printers (Dot Matrix, Inkjet, Laser)
- Printer Installation & Configuration
- Printer Sharing in a Network
- Troubleshooting Printers & Peripherals

Module 9: Troubleshooting & Maintenance

- Hardware Troubleshooting (Power, RAM, Storage, Display, Motherboard)
- Software Troubleshooting (OS Errors, Driver Issues, Application Failures)
- Virus & Malware Troubleshooting
- Preventive Maintenance Practices
- System Cleaning & Optimization

Module 10: Networking Fundamentals

- Introduction to Networking (LAN, WAN, MAN)
- Network Devices: Hub, Switch, Router, Modem, Access Point
- IP Addressing: IPv4, IPv6, Subnetting Basics
- Cabling: UTP, STP, Fiber Optics
- Crimping LAN Cables & Cable Testing
- Wireless Networks (Wi-Fi Setup & Security)

Module 11: Network Configuration & Sharing

- Configuring Networks in Windows & Linux
- File Sharing & Printer Sharing
- Internet Connection Sharing
- Remote Desktop & Remote Support Tools
- Basic Network Troubleshooting Commands (ping, ipconfig, tracert)

Module 12: Linux Networking Basics

- Linux File System & User Management
- Permissions & Ownership
- Essential Linux Commands for Networking (ifconfig/ip, netstat, ping, traceroute)
- Package Installation (apt, yum basics)
- Configuring Network Interfaces in Linux

Module 13: Cybersecurity & Data Protection

- Introduction to Cybersecurity
- Malware Types & Prevention
- Firewalls & Antivirus Tools

- Safe Browsing & Phishing Awareness
- Data Backup & Encryption Basics
- Security in Network Sharing

Module 14: Virtualization & Cloud Computing (Introductory)

- Concept of Virtualization
- Installing & Using VirtualBox/VMware
- Creating & Managing Virtual Machines
- Cloud Storage Basics (Google Drive, OneDrive, Dropbox)
- Cloud Backup & Collaboration Tools

Module 15: Soft Skills & Career Preparation

- IT Support Communication Skills
- Documentation & Reporting of Issues
- Resume Writing & Job Interview Preparation
- Industry Certifications Guidance (CompTIA A+, N+, CCNA Basics)

Module 16: Final Project & Assessment

- PC Assembly & OS Installation Project
- LAN/Wi-Fi Network Setup & Sharing Project
- Hardware & Network Troubleshooting Project
- Practical Evaluation + Viva + Written Exam