

Diploma in Computer Hardware (DCH)

Duration: 6 Months

Course Overview

The Diploma in Computer Hardware (DCH) is a career-oriented training program designed to provide in-depth knowledge and hands-on skills in computer hardware, software installation, troubleshooting, and basic networking. Students will gain expertise in assembling PCs, configuring BIOS/CMOS, installing operating systems, handling printers, troubleshooting hardware/software issues, and maintaining computer systems. The course also introduces laptop hardware, cybersecurity basics, and modern diagnostic tools to prepare students for today's IT industry requirements.

Course Objectives

1. To build a strong foundation in computer fundamentals, hardware components, and operating systems.
 2. To train students in PC assembly, BIOS/CMOS configuration, and system performance optimization.
 3. To provide skills in installation of Windows/Linux OS, device drivers, and essential software.
 4. To develop troubleshooting expertise for hardware, software, and peripheral devices.
 5. To introduce networking basics, cybersecurity practices, and laptop hardware differences.
 6. To train students in using modern diagnostic tools and preventive maintenance techniques.
 7. To prepare students for careers in computer hardware service, technical support, or IT infrastructure maintenance.
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Course Outcomes

After successful completion of the course, students will be able to:

- Identify, explain, and work with different computer components, peripherals, and storage devices.

- Assemble and configure a fully functional computer system.
 - Install and manage operating systems (Windows/Linux) and essential software.
 - Troubleshoot and resolve hardware, software, and printer-related issues.
 - Set up and maintain basic computer networks.
 - Handle laptop hardware differences and preventive maintenance.
 - Apply cybersecurity awareness and use diagnostic tools for system health checks.
 - Document service reports and communicate effectively with clients.
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Detailed Course Syllabus

Module 1: Computer Fundamentals & Micro Computers

- Introduction to Computers
 - Generations & Classifications of Computers
 - Hardware, Software, Firmware Concepts
 - Number Systems & Data Representation
 - Overview of Personal/Micro Computers (Desktop, Laptop, All-in-One, Mini-PC)
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Module 2: Windows Operating System & Basic Networking

- Introduction to Windows OS (Features & Versions)
 - Desktop, File & Folder Management
 - Control Panel, System Tools & Security Settings
 - User Accounts & Permissions
 - Networking Basics
 - LAN, Wi-Fi setup, IP addressing
 - Network devices: Switch, Router, Modem
 - File & Printer sharing over a network
 - LAN cable crimping and testing
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Module 3: Computer Components in Detail

- CPU, Motherboard & Chipsets
 - Motherboard Architecture (slots, ports, connectors)
 - BIOS/UEFI & CMOS Configuration
 - POST & Beep Codes
 - SMPS & Power Supply Units
 - Memory: RAM types (DDR3/DDR4/DDR5), Cache, ROM, VRAM
 - Storage Devices: HDD, SSD, M.2, NVMe, Optical Drives, Cloud Storage Basics
 - Input Devices: Keyboard, Mouse, Scanner, OCR, MICR, OMR
 - Output Devices: Monitor types (CRT, LCD, LED, OLED), Printers, Projectors
 - Add-on Cards: Graphics, Sound, NIC, TV Tuner
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Module 4: Printers & Peripherals

- Basics of Printers: Dot Matrix, Inkjet, Laser
 - Printer Installation & Configuration
 - Printer Troubleshooting Techniques
 - Other Peripherals: External Storage, USB Devices, Projectors
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Module 5: PC Assembly & CMOS Setup

- Tools & Safety Precautions
 - Step-by-step Computer Assembly (Cabinet, Processor, RAM, Storage, Add-on Cards)
 - Cabling & Front Panel Connections
 - First Boot & BIOS Setup
 - Testing & Verification of Assembly
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Module 6: Installation of Operating Systems & Software

- Disk Partitioning & File Systems (FAT32, NTFS)
- Installing Windows OS (step by step)
- Installing Linux OS (step by step)

- **Dual Boot Setup**
 - **Device Drivers Installation**
 - **Installing Application & Utility Software (Office, Antivirus, Multimedia Tools)**
 - **System Updates & Patch Management**
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Module 7: Troubleshooting & Maintenance

- **Hardware Issues: SMPS, RAM, Storage, Motherboard, Display**
 - **Software Issues: OS Errors, Application Failures, Virus/Malware Issues**
 - **Laptop Hardware Basics (Battery, Cooling, Slim RAM, Ports)**
 - **Preventive Maintenance – Cleaning, Dusting, Cooling Management**
 - **Backup & Recovery Techniques**
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Module 8: Cybersecurity & Diagnostic Tools

- **Introduction to Malware, Ransomware, Phishing**
 - **Antivirus & Firewalls Basics**
 - **Password & Data Security Practices**
 - **Diagnostic Utilities: HWMonitor, CPU-Z, CrystalDiskInfo, Memtest**
 - **AI-driven Tools & Future of System Maintenance (awareness)**
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Module 9: Professional Skills for Hardware Technicians

- **Service Documentation & Maintenance Logs**
 - **Preparing Technical Reports**
 - **Effective Client Communication**
 - **Job Roles in Hardware & IT Support Industry**
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Module 10: Final Project & Assessment

- **Complete PC Assembly & OS Installation**
- **Configuring Network & Printer Setup**

- **Troubleshooting Hardware & Software Simulations**
 - **Written Test + Viva + Practical Evaluation**
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☒ **With this revised syllabus, the DCH course becomes holistic, modern, and industry-relevant. Students won't just learn PC basics but will also be aware of networking, laptops, cybersecurity, and diagnostic tools – giving them an edge in the job market.**