

**P.G.DIPLOMA IN COMPUTER HARDWARE AND  
NETWORKING  
( P . G . D . C . H . N . )**

**FULL TIME (ONE YEAR)**

**COURSE STRUCTURE**



**UNIVERSITY SCIENCE INSTRUMENTATION CENTRE (USIC)**

**GUJARAT VIDYAPITH : AHMEDABAD – 14**

**YEAR- 2014**

## **P. G. Diploma in Computer Hardware and Networking**

- 1. Name of the Course:- P. G. Diploma in Computer Hardware and Networking.**
- 2. Eligibility :- Any Graduate**
- 3. Duration :- One Year (Full Time)**
- 4. Intake :- 20 (Twenty) Student.**
- 5. Course Fee :- Rs. 5825/-**
- 6. Course Timing :- Monday to Saturday 08:00 AM to 1:30 P.M.**
- 7. Medium of Teaching:- Gujarati / English.**
- 8. Admission Procedure:- By written and oral Exam.**
- 9. Presence (Working days)**
  - (i) Not more than 10 absent in Prayer is allowed to seat in the final exam.
  - (ii) Not more than 10 absent in Class room is allowed to seat in the final exam.

# OBJECTIVES

1. To establish the self employed Society.
2. To generate the Computer Hardware Professionals.
3. To Train the lower order Technicians.
4. To generate man power at different level to enable the country to face the challenge of world modern I.T. and Instrumentation.

# P.G.DIPLOMA IN COMPUTER HARDWARE AND NETWORKING

## STRUCTURE, SUBJECT AND EXAM CODE (ONE YEAR FULL-TIME)

### Semester-I

Paper No.	Name of Subject	External Marks	Internal Marks	Total Marks
DCHN 101	Basic Electronics & Measuring Instruments	60	40	100
DCHN 102	Computer Hardware & Peripherals	60	40	100
DCHN 103	Operating System & Diagnostics Tools	60	40	100
DCHN 104	Practical Lab (101,102,103)	90	60	150
COMPL 101	Padyatra	-	40	40
COMPL 102	Udyog	-	40	40
	Community Life	-	-	Grade

### Semester-II

Paper No.	Name of Subject	External Marks	Internal Marks	Total Marks
DCHN 201	Principal of Digital Electronics	60	40	100
DCHN 202	Network Essentials & Management	60	40	100
DCHN 203	Operating System Administration	60	40	100
DCHN 204	Practical Lab (201,202,203)	90	60	150
DCHN 205	Industrial Training	-	-	Grade
COMPL 201	Udyog	-	40	40
	Community Life	-	-	Grade
Total	-	540	480	1020

# P.G.DIPLOMA IN COMPUTER HARDWARE AND NETWORKING

## STRUCTURE, SUBJECT AND EXAM CODE (ONE YEAR FULL-TIME)

### Semester-I

Paper No.	Name of Subject	Credit
DCHN 101	Basic Electronics & Measuring Instruments	4
DCHN 102	Computer Hardware & Peripherals	4
DCHN 103	Operating System & Diagnostics Tools	4
DCHN 104	Practical Lab (101,102,103)	6
COMPL 101	Padyatra	2
COMPL 102	Udyog	2
	Community Life	Grade
	First Semester Credit	22

### Semester-II

Paper No.	Name of Subject	Credit
DCHN 201	Principal of Digital Electronics	4
DCHN 202	Network Essentials & Management	4
DCHN 203	Operating System Administration	4
DCHN 204	Practical Lab (201,202,203)	6
DCHN 205	Industrial Training	4
COMP201	Udyog	2
	Community Life	Grade
	Second Semester Credit	24

**PAPER – 1**  
**PAPER CODE DCHN - 101**  
**Basic Electronics & Measuring Instruments**  
**(TOTAL MARKS : 100)**

## **Theory Work**

### **1.1. Basic Electricity and conducting Material.**

Introduction, Current, Voltage, emf, Power generation system, Switch- plug wiring, Analyzing Conductivity of elements, Types of Conductors, Semi conductors - Silicon, Germanium.

### **1.2. Electronics Components.**

Resistors, Capacitors, Inductors, Transforms, Types, working and Properties, Voltage and current sources, Diode, Zener diode, Photo diode, Light emitting diode(LED), Transistors (NPN, PNP), their characteristics and uses, Field effect transistor, Photo transistor.

### **1.3. Electronics Circuits.**

AC Fundamentals, Ohm's law, Series and Parallel connection of Registers and Capacitors, Half wave rectifier, Full wave rectifier and Bridge rectifier.

### **1.4. Regulated Power Supply.**

Basic regulated power supply using Zener diode

Block diagram of IC based Power supply.

Basic Switch Mode Power Supply (SMPS)

Basic uninterrupter Power Supply (UPS)

### **1.5. Basic Measuring Instruments.**

Multimeters – Electronics and Digital,

Cathode Ray Oscilloscope (CRO), Block diagram and basic working.

Different uses of CRO, LCR – Q meter. Measurement by all given device.

Different tools used for practical's, Soldering and desoldering practice

## **REFERENCE BOOK**

(1) Mason Basic Electronics

By D.B. Kadia, B.K. Kadia

(2) Electronics Principles

By Malvino

Mc Graw-Hill Publication

(3) Digital computer Electronics.

By Albert Paul Malvino

Tata Mc Graw-Hill Public

**PAPER – 2**  
**PAPER CODE DCHN - 102**  
**Computer Hardware & Peripherals**  
**(TOTAL MARKS : 100)**

## Theory Work

### 2.1 Microprocessor System

Introduction of System overview, Introduction to Processors, Memory Interfacing, Interfacing I/O Devices, Interfacing Data Converters, Display Interface, Serial I/O and Data Communication, Higher level Processors

### 2.2 Introduction to PC Architecture

Study of PC-AT/ATX System, Pentium, Core, Core 2 Duo, Core 2 Duo, I3, I5, I7 Processor  
Basics of Processor and CPU  
Block Diagram of Computer and Computer Generation  
Motherboards, Chipset and Controllers, BIOS and the Boot Process, Computer Memory.

### 2.3 Internal Components

IDE and SATA Devices: Hard Disk Drive and CD/DVDs Drives,  
SCSI Devices, Floppy Disk, Zip Drive, Backup Drive,  
Expansion Cards- LAN Card, IDE Card, VGA and SVGA Cards, Sound Card, Interface Cards, I/O cards, Video Cards, USB Card, Fire-Wire Cards, Internal Ports, Cables and Connector Types.

### 2.4 External Components

Monitors:- CRT, LCD and LED Displays,  
Printers:- Dot-Matrix Printer, Inkjet Printer, Laser Printer  
Scanner:- Photo Scanner, Documents Scanner, Bar Code Scanner  
Keyboards, Mouse, External Modem, Ports and Connectors, Batteries, Power supply, Pen Drives, SCSI interface devices, Laptop Computers, Digital Advance storage technology.

### 2.5 Network Components

Introduction of Network Cable like UTP, STP, Fiber Optics, Hub, Unmanageable Switch, Manageable Switch, Router, Modem, Wi-Fi, Access Point, PCI Wireless Card, USB Wireless Device, Print Server, USB Network Sharer, Backup Device, Server Hardware etc.

## **REFERENCE BOOK**

- |   |                    |                                  |
|---|--------------------|----------------------------------|
| (1) Microprocessor Architecture<br>Programming and Application<br>with the 8085 | Ramesh Gaonkar     | Penram International Publication |
| (2) Electronics and Radio Engineering   | M.L. Gupta         | Dhanpat rai & Sons, New Delhi    |
| (3) PC AND CLONES Hardware,<br>Troubleshooting and Maintenance                  | B. Govinda rajalu, | Tata Mc-graw-Hill Publication    |
| (4) PC Troubleshooting and Repair   | Stephen J. Bigelow | Dream tech Press, New Delhi      |

**PAPER – 3**  
**PAPER CODE DCHN - 103**  
**Operating System & Diagnostics Tools**  
**(TOTAL MARKS : 100)**

## **Theory Work**

### **3.1 Operating System Basics & Installation**

Introduction to OS, Types of Operating systems, System files FAT and NTFS  
Dos 6.22, Windows XP, Windows Vista, Windows 7 and Windows 8 and RedHat Linux and Multi Boot Operating System

### **3.2 Various types of Software Installation**

Office Automation Tools, Photoshop 7 and CS5, PageMaker 6.5, Corel-Draw X3, Auto-CAD, Tally 7.0 and ERP, Acrobat Reader X, Java, Visual Studio, C & C++, Multimedia software's, and Internet Browsers like- IE9, Google Chrome, Mozilla Firefox etc.

### **3.3 Device Installation**

Graphics Card, Sound Card, LAN Card, Wireless LAN Card, SCSI Card, External Drive, Flash Cards, Web Camera, CCTV Camera, MobileDevices, Pen Drive, Firewire Cards, Modem, Plotter, Wireless LAN, Access Point etc.

### **3.4 Diagnostic Tools & PC Maintenance**

Introduction, Virus and its types, Effect of Virus for Computer System, Scanning and Antivirus remover tools, Antivirus Utilities for Diagnostic, Safety and Preventive Maintenance Tools, Data Recovery, Concept of Fax and E-mail, PC care and Maintenance, Electrical Power Issues, Troubleshooting PC Hardware:- O/S Troubleshooting issues in computer System

### **3.5 Basic Network Introduction & Installation**

Introduction About Network, Installing Network Operating System Windows 2003 Server and Windows 2008 Server, Cable Crimping, Network Sharing and user Permission, Internet Connection, E-Mail, Cloud Networking, Google Drive, SkyDrive, Dropbox etc.

### **3.6 Introduction and installation of Linux**

History of Linux, Linux distributions, Features of Linux, advantages of Linux Installation of Red Hat and SUSE Linux and Ubuntu Edition, System requirements, Disk partition, Mount points, Installation method, creating the boot disk.

### **3.7 Working with Linux GNOME and KDE**

User Management, Mounting, X- windows Desktop environment, Using Gnome and KDE Desktop environment, Linux commands, Linux file system, directories, Text Editors, Linux Shell, Feature of Shell, Shell available.

## **REFERENCE BOOK**

- |  |                 |
|--|-----------------|
| (1) Windows 98                               | BPB Publication |
| (2) Windows XP Professional edition complete | BPB Publication |
| (3) Office XP complete                       | BPB publication |



**PAPER – 4**  
**PAPER CODE DCHN -104**  
**PRACTICAL LAB (101,102,103)**  
**(TOTAL MARKS : 150)**

## **Practical Work**

1. Switch Board Wiring and Testing
2. Soldering and De-Soldering Practice
3. Component Testing and Symbols
4. Voltage Measurement of Different Circuits
5. Testing and Measurement of SMPS
6. Half wave, Full wave & Bridge rectifiers
7. Electronic Project ( Minor Project )
8. Assembling of a Computer
9. Installation of different Operating Systems
10. Installation of different device drivers
11. Installation of different Application Software
12. Biometric Security Device Installation and Configuration
13. To Run All Dos Command (Internal and External Dos Command)
14. Assembling and Disassembling Of a Computer System
15. Installation of Different Operating Systems : Windows XP, Windows 7
16. Troubleshooting and Repair Operating System : Windows XP, Windows 7
17. Tacking Data Backup and System Formatting and OS Installation
18. Installation of Different Device and Drivers PCI, PCI-E, AGP
19. Installation of Ms Office 2003, Ms-Office 2007 and Ms-Office 2010
20. Installation of On Board and PCI Device Driver
21. Installation of Web Camera and CCTV Camera Drivers and Software
22. Installation of Application Software : Photoshop 7.0, Page Maker 6.5, CorelDraw 12
23. Installation of CD-DVD Burning Software like: Nero 7.0 & PowerISO 4.0
24. Installation of Tally 7.2 and Tally ERP 9.0 and Tack Data Backup
25. Installation and Troubleshooting Different types of Antivirus Software
26. Installation Dual Operating System like: Windows XP and Windows 7
27. Installation and Troubleshooting of Printer (Dot-Matrix and Laser Printer)
28. Installation and Troubleshooting of Scanner (Photo & Bar Code Scanner)
29. To Repair and Troubleshooting of SMPS, Monitor, Printer and Motherboard
30. To Install All Types of Connectors and Converters
31. To Run All Types of Network Troubleshooting Command

**PAPER – 5**  
**PAPER CODE DCHN - 201**  
**PRINCIPLES OF DIGITAL ELECTRONICS**  
**(TOTAL MARKS: 100)**

## **Theory Work**

### **1.1 INTRODUCTION TO DIGITAL ELECTRONICS:**

Basic difference between analog and digital Signal  
Application and advantages of digital signal processing

### **1.2 NUMBER SYSTEM:**

Decimal odometer, Binary odometer, Why Binary numbers are used,  
Binary, Decimal and Hexadecimal number system; Conversion from decimal and hexadecimal  
to Binary and vice versa, BCD numbers,  
ASCII code, Basic Concept of parity.

### **1.3 LOGIC GATES & LOGIC FAMILIES:**

Definition symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates.  
Simple application in developing combinational logic circuits  
Diode Logic, Transistor Inverter, TTL Logic

### **1.4 FLIP FLOPS:**

Brief idea of flip-flops and their operations

- RS Latches
- Level Clocking
- D – Catch
- JK Flip- Flops
- JK Master – Slave Flip- Flops

### **1.5 REGISTERS, COUNTERS AND MEMORIES**

- Buffer Register
- Shift Register
- Synchronous Counters
- Ring Counters
- ROMs, PROMs and EPROM's
- ROMs
- Small TTL Memories.

**PAPER – 6**  
**PAPER CODE DCHN -202**  
**Network Essentials & Management**  
**(TOTAL MARKS: 100)**

## **Theory Work**

### **2.1 Overview of Networking**

Introduction to networks and networking, LAN, VLAN, CAN, MAN, WAN, Internet and Intranet etc. Uses and benefits of Network, Server-client based network, peer to peer networks.

### **2.2 Network Hardware and Components**

Concept of Server, client, node, segment, backbone, host etc. Analog and Digital transmission, Network Interface Card, Crimping tools and Color standards for Straight crimping and Cross crimping Functions of NIC, Repeaters, Hub, Switches, Routers, Bridges, Router etc.

### **2.3 Transmission Media and Topologies**

Media types: STP cable, UTP cable, Coaxial cable, Fiber cable, Base band and Broadband transmission, Cables and Connectors, Physical and logical topologies, Bus, Star, Ring and Mesh topologies

### **2.4 Protocols and Services**

HTTP, FTP and other Different types of protocols, OSI Model, Media Access Method, DNS services, DHCP services, Remote Access Services, Proxy Services etc.

### **2.5 TCP/IP and Sub-netting**

Introduction about TCP/IP Model and Sub-nettings, configuring IP address and subnettings with different Routers and Network, TCP/IP Errors and Solutions and Network Troubleshooting Issue.

## **REFERENCE BOOK**

- |     |                     |                             |
|-----|---------------------|-----------------------------|
| (1) | Networking Complete | BPB Publication             |
| (2) | Computer Networking | Andrew S. Tanenbawan By PHI |

**PAPER – 7**  
**PAPER CODE DCHN -203**  
**Operating System Administration**  
**(TOTAL MARKS: 100)**

## **Theory Work**

### **3.1 Introduction and Installation of Server**

Installation of server like windows 2003 and 2008, user account administration, group management, implementing DNS server, creating a Domain account, File system NTFS permission.

### **3.2 Configuring Services**

Printing services, Active Directory services, DNS services, DHCP services, RAS, Volumes and Disk management, Auditing and Resource Access, Gateway services, Terminal services, Configuring & implementing VPN, Local and Domain security policy, Group Policies

### **3.3 Network Administration**

Installing and Configuring Wire & Wireless Network, Network Troubleshooting, Installing Manageable Switches, Routers, Wi-Fi Device, Printer, CCTV Camera, IP Camera and Other Network Devices, Storage Solution– TAP Drive

### **3.4 WANs and Remote Connectivity**

Public networks, Remote connectivity for server and clients, Indoor and Outdoor Wireless, WLAN- WIFI and WIMAX, PCI Wireless Card, USB Wireless Card, Wireless Access Point, Security of networks like Firewalls Hardware and Software, VPN,

### **3.5 Networking with Linux**

Installing and setting up a Network card, Setting TCP/IP parameters with Linux, Testing the network, Utilities of Linux, TAR Program, Send Mail, Send mail Configuration, Pine, Browsers, NFS and Samba Configuration, Network Printing and Interoperability with windows.

### **3.6 Linux Services and Network Security**

Administering user accounts and groups, command line tool, Network Services, Proxies, Firewalls, NIS and Host Security, Diskless Terminal, File systems, IP address, DNS and Internet, Security fundamentals, system security, choosing user ID's for services, Network security, IT laws and security.

#### **REFERENCE BOOK**

(1) Windows 2003 and 2008 Server

(2) Windows XP Professional and Windows 7 Edition

(3) Red Hat Linux

(4) Linux Bible

By BPB Publication

By BPB Publication

By BPB & SYBEX publication

By BPB & SYBEX publication

**PAPER – 8**  
**PAPER CODE DCHN -204**  
**PRACTICAL LAB (201,202,203)**  
**(TOTAL MARKS : 150)**

## **Practical Work**

1. Installing and Configuring Windows 2003 and 2008 Server
2. Cable Crimping using Different Color Codes (Straight and Cross Cable )
3. Installation and configuring Peer to Peer and Server-Client Network
4. Installation and Configuring Active Directory Services
5. Installation and Configuring DNS & DHCP Services
6. Installation and Configuring FTP, HTTP Services
7. Backup and Restoration for ADS, DHCP and User Data
8. FAT and NTFS Sharing Permission
9. Configuring & Implementing Unmanageable Network Switch
10. Configuring & Implementing Manageable Network Switch
11. Configuring a Local Security Policies & Domain Security Policies
12. Installing Printer in Windows XP, Windows 7, Windows 2003 & 2008 Server
13. Configuring Gateway Service for Internet Connectivity
14. Configuring ADSL+2 Router for BSNL Internet Connectivity
15. Configuring Wireless Access Point
16. Installation and Configuring Wire Network
17. Installation and Configuring Wireless Network
18. Installation of AD-hoc Wireless Network
19. Installation and Configure Different Antivirus Software and Admin Console
20. Remote Desktop, Remote Assistance, Telnet, HyperTerminal, TeamViewer

PAPER – 9  
PAPER CODE DCHN -205  
Industrial Training

## Industrial Training

- (1) Student should go under one month training at related industries.
- (2) He should keep daily work report duly signed by concern person of related industry and submit to department.
- (3) Grade should be assigned at the end of training by concern person of industry according to his performance.
- (4) He should submit satisfactory Certificate to the department at the end of training.