



Diploma in Computer Hardware maintenance and Network Technologies

Duration : One year including 3 months industrial Training

The examination and evaluation pattern : Same as BTE

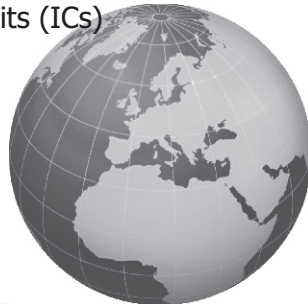
The Structure of the DCHMNT program (Total 32 CP)

- Digital computer Electronics, Theory (4CP)
- Digital computer Electronics, Practical (4CP)
- How computer works? Theory (4CP)
- How computer works? Practical (4CP)
- How computer is maintained? Practical (4CP)
- Networking Technologies, Theory (4CP)
- Networking Technologies, Practical (4CP)

Detail Syllabus of the DCHMNT program:

Course 1) Digital Computer Electronics, Theory (4CP)

1. Number Systems - Decimal and Binary
 - Why binary system is preferred?
 - Decimal to Binary and vice versa conversion
 - Hexadecimal Numbers-Hexa to Binary and Binary to Decimal vice versa conversion
 - BCD numbers and ASCII code
2. Gates -
 - OR-AND gates-Basic Boolean Algebra-Invertors
 - NOR-NAND gates - D' morgan Theorem (1 and 2)
 - Exclusive OR gates, Exclusive NOR gates
 - Controlled Invertors
3. TTL -
 - Digital Intergrated Circuits (ICs)



Indira Technical Institute, Nashik

(Government Recognized)



TTL characteristics, AND/OR gates using TTL, Open collector Application and Advantages
MOS, CMOS
Multiplexer
IC devices like 74.....Family

4. Boolean Algebra and Karnaugh Maps-
Boolean Relation, Sum of products method, Algebraic specification
Karnaugh Map, Pairs, Quads, Octets, No care condition (4 variables)
5. Logic Units -
Binary addition and subtraction - Half and full adders (Binary adders)
2's and its complement - Adders and Subtractors, Signed Binary numbers
MOS, CMOS encoder
6. Flip-Flops-
Simple flip-flop action-RS latch-De latching level checks
Edge triggering advantages - D and JK flip-flops edge triggering
JK master and slave flip-flops
7. Registers, Counters -
Register meaning - Buffer - Shift and controlled shift registers three state registers - devices
Counters - Its necessity, Simple circuits, Ripple, Synchronous, Ring counters, Devices.
Bus organized computers.
8. Memories :
ROM, PROM & EPROM - RAM - Constructing a small memory and its Hexadecimal Address.



Flash, DVR memories

Course 2) Digital Computer Electronics, Practical Course (4CP)

1. Identification and Testing of computer electronic components
2. Soldering and De-soldering practice, Assembling and testing of Bridge rectifier
3. Activity on NO systems - Hexa Decimal
4. Study of Homkit manual and study of logic gates with switches.
5. Study of logic gate operations (AND, OR) circuit diagram
6. Study of basic gates and derived gates.
7. XOR gate as comparator.
8. Study of Demorgan's Theorem.
9. Use of K map.
10. Ripple counter
11. Up/Down Counter synchronous.
12. Programmable counter
13. Decade Counter 7490
14. Shift Registers.
15. Combination of Logic gates.
16. Timing diagrams
17. Responses of NAND gate.
18. Assembly of OSC with gates.
19. Study of Decoder.
20. Synchronous decade counter.
21. Eight bit reversible counter.
22. Ring counter.
23. Understanding Block diagram of a PC.
24. a) Study and verification of truth tables of AND, OR, NOR, NOT and NAND logic gates.
b) Construct and test NOT and NAND gates using NOR logic.





25. Construct and test a full adder using IC logic blocks.
26. Construct and verify action of R-S flip-flop and D flip-flop.
27. Construct and verify action of T flip-flop and J-K flip-flop.
28. Construct and verify Johnson's Counter and Ring counter.

Course 3) How computers work. Theory Course (4CP)

1. Boot-up process
 - Getting to know the hardware
 - How a computer wakes up
 - How a disk boot works
 - How an operating system controls hardware
 - Computers of the next millenium
2. How software works
 - How porgramming languages work
 - How windows works
 - How software applications work
 - How software will work
3. Microchips
 - How a transistor works
 - How RAM works
 - How a microprocessor works
 - How microchips will work
4. Data Storage
 - How disk storage works
 - How a floppy drive works
 - How a hard drive works
 - How disk drives increase speed and stroage
 - How removable stroage works
 - How storage will work





5. Input/output Devices
 - How energy turns into data
 - How a bus works
 - How computer ports work
 - How a keyboard works
 - How a computer display works
 - How pointing devices work
 - How game controllers work
 - How a modem works
 - How scanners and optical character recognition work
 - How portable computers work
 - How high tech input/output works
 - How input/output will work
6. Multimedia
 - How CD-ROM and DVD work
 - How multimedia sound works
 - How multimedia video works
7. How the internet works
 - How local area networks work
 - How a PC connects to the internet
 - How email works
 - How internet video and audio work
 - How the world wide web works
8. How printers work
 - How basic printing works
 - How color printing works
 - How printers will work

Course 4) How computer are maintained? Theory (4CP)

- 1 Basic Computer Service Concepts





- 2 PC Architecture
- 3 PC Memory Architecture
- 4 Disk System Architecture
- 5 PC Bus Architecture
- 6 Peripheral Devices
- 7 How Printers Work
- 8 Networking Fundamentals
- 9 Installation and Upgrades
- 10 Introduction Techniques
- 11 Introduction to Computer Operating Systems
- 12 Using the Microsoft Operating System GUI
- 13 Installing and Using Windows 95/98
- 14 Installing and Using Windows 2000 Professional
- 15 Application Installation and Configuration
- 16 Using and Configuring Additional Peripherals
- 17 Preventative Maintenance
- 18 Configuring Network Software
- 19 Window and application Troubleshooting
- 20 USB

Course 5) Computer Maintenance Lab-1: Practical (4CP)

- Lab 1: Start Up, Navigate, and Shut Down a Window System
- Lab 2 : CMOS Setup
- Lab 3 : Safely Open the Case to Identify Components
- Lab 4 : Collect Resource Information - Window 98
- Lab 5 : Collect Resource Information - XP
- Lab 6 : Collect Resource Information - Window 2000
- Lab 7 : Replace s Floppy Drive
- Lab 8 : Replace the Hard Drive



- Lab 9 : Add a Slave Drive
- Lab 10 : Install a Window Mouse
- Lab 11 : Partition a Hard Drive-FAT32
- Lab 12 : Partition a Hard Drive - Two Partitions-using FDISK
- Lab 13 : Partition HDD-NTFS (Win XP)
- Lab 14 : Replace a Power Supply
- Lab 15 : Remove and Insert Memory
- Lab 16 : Remove and Replace a Motherboard
- Lab 17 : Resolve an IRQ Conflict - Window 98
- Lab 18 : Resolve an IRQ Conflict - Window XP
- Lab 19 : Resolve an IRQ Conflict - Window 2000
- Lab 20 : Troubleshoot Hardware Problems
- Lab 21 : Dual boot Windows XP and Windows 2000

Course 6) Computer Maintenance ab-2: Practical (4CP)

- Lab 22 : Install an Operating System - Windows XP
- Lab 23 : Install an Operating System - Windows 98
- Lab 24 : Install an Operating System - Windows 2000
- Lab 25 : Customize the Windows Desktop
- Lab 26 : Use Files and Folders
- Lab 27 : Image and Replace a Windows 98 Hard Drive
- Lab 28 : Install and Launch Windows Applications
- Lab 29 : Install a CD and DVD
- Lab 30 : Install a CD-ROM Drive - Windows
- Lab 31 : Install a Sound Card - Windows
- Lab 32 : Install a printer - Windows
- Lab 33 : Use scan disk and defrag - Windows
- Lab 34 : Create an ERD and Startup Disk - Windows 98
- Lab 35 : Create an ERD and Startup Disk - Windows NT 4.0
- Lab 36 : Create an ERD and Startup Disk - Windows 2000





- Lab 37 : Configure and Connect Dial-Up Networking
- Lab 38 : Configure a peer-to-Peer Network
- Lab 39 : Troubleshoot Software
- Lab 40 : Scanner installation

**Option 1: Windows 2000 Server
Course 7) Network Technologies, Theory**

1. Windows 2000 Server overview
2. Getting comfortable with active directory
3. Installing Windows 2000 server
4. The Windows 2000 Server User Interface and Microsoft Management Console
5. Understanding the Registry Database
6. Installing Hardware in Windows 2000
7. Managing Windows 2000 storage
8. Managing and Creating User Accounts
9. Creating and Managing Shared Folders
10. Software Installation
11. Configuring and Troubleshooting Network Print Services
12. Connecting Clients to Windows 2000 server
13. Supporting Clients with Windows Terminal Services
14. How running a Big Windows 2000 Network Is Different
15. Integrating Netware with Windows 2000 server
16. Understanding and Using TCP/IP in Windows 2000 server
17. Building a Windows 2000 TCP/IP Infrastructure : DHCP, WINS, Sites and More
18. Internet Information Services in Windows 2000 server
19. Tuning and Monitoring Your Win2K Network
20. Preparing for and Recovering from Server Failures
21. Installing and Managing Remote Access Service in Windows 2000 server





Course 8) Network Technologies, Pratical

1. Building an Active Directory
2. Creating a New User Account in Active Directory
3. Setting Password
4. Installing Windows 2000 Server
5. Installing Windows 2000 Workstation
6. Adding and Subtracting Network Services
7. Adding New Hardware and Working with Device Manager
8. Setting up Password Policy
9. Fixing Windows 2000 GUI
10. Working with Microsoft Management Console Primer
11. Working with Registry
12. a) Installing new physical hard disk b) creating strip set, volume set and RAID5 volumes.
- 13) a) Creating and modifying users and groups b) Working with groups in Windows 2000
- 14) a) Working with group policies object b) Working with users profiles
- 15) Creating and managing permission for shared folder
- 16) Creating and managing DFS (Distributed File System)
- 17) Creating and managing Web share
- 18) a) Creating your own MSI b) Software distribution using ZAP files
- 19) Configuring and troubleshooting Network Print Services
- 20) Connecting Windows 95/98 Workstation
- 21) Integrating Netware and Windows 2000
- 22) Migrating from Netware and NDS to Windows 2000 and active directory
- 23) Installing TCP/IP on Windows 2000
- 24) Setting up Routing on Windows 2000





- 25) Configuring LAN to WAN and Routing with internet connection sharing
- 26) Installing and Configuring DHCP Server
- 27) Installing WINS and configuring Wins SErver
- 28) Installing the DNS service with DNS manager
- 29) Installing E-mail Server
- 30) Installing Internet Information Services
- 31) Working with System Monitor ABD Event Viewer
- 32) a) Taking back-ups b) Creating and usig emergency repair disk
- 33) Installing and Configuring RAS (Remote Access Services)
- 34) Implementing VPN

Option 2: Linux

Course 7) Networking Technologies, Theory

Preparation to install the Red Hat Linux (RH L)

Installing RH L

Post Installation configuration

First steps with RHL

The X Window system

Managing Services

Managing software and system resources

Managing users

Managing filesystems





DIPLOMA FOR ELECTRICIAN AND DOMESTIC APPLIANCES MAINTENANCE

Particulars	Credit Points
ELE 101 - Electrical Theory	8
ELE-102 - Electrical Practical	12
DAP 101 - Appliances Repair (Theory)	8
DAP 102 - Appliances Repair (Practical)	12
1) Safety Rules	
2) Electric Shock and First -Aid	
3) Safety from Fire	
4) Tools required for Electrical work.	
5) Basic measurements & Definitions	
6) Ohm's Law - Series & Parallel Circuits	
7) Conductor and Resistance	
8) Wire	
9) Wiring Accessories	
10) Wiring	
11) To check wiring, Earthing.	
12) Soldering	
13) Over head wiring	
14) Primary & Secondary Cell	
15) D. C. Generator & Motor	
16) A.C. Motor and Starter	
17) Circuit Breaker	
18) Electrical Measurements	



- 19) Electric Lamps
- 20) Electrical Domestic Appliances
- 21) Charts of Important Wiring connections
- 22) Indian Electricity Act -1956
- 23) Useful Charts
- 24) Signs & Symbols
- 1) Heater:- Room Heater, Elect. Stove, To prepare Heater Element, Method of finding & removing fault, Precautions, Immersion Heater and common faults.
- 2) Electric Iron :- Simple Elect. Press or non Automatic Elect. Press. Main parts of press, Method of opening & assembling. Testing and fault finding, Automatic Press Thermostat, Circuit Diagram of Automatic Press. Working of Thermostat
- 3) Electric Kettle :- Tube Type Element, Mica Type Element, Key fault finding, Precautions.
- 4) Room Cooler :- Cooler Pump, Cooler Pump Motor, Capacity of Cooler Pump, To open cooler pump, Motor rewinding of cooler pump. Connection of winding terminals, Coil winding of motor's magnetic field, to prepare starting coil, to place running coil in slots, Connections of starting and running coil. To study cooler fan motor's working.
- 6) Domestic Pump Set (Tullu Pump) : Various parts of centrifugal Pump, Method of opening the pump set. Assembling the pump set, Fault finding in Centrifugal Pump, Study of Domestic Pump Set motor.
- 7) Electric Mixer : Different parts of Mixer, electric motor of mixer, to change the rotating direction, Armature coil rewinding, Testing of armature, To check and test the armature after removing faulty winding, Types of armature winding, Varnishing, To test armature winding, Fault finding of a mixer.
- 8) Washing Machine : Conventional type washing machine, Semi automatic





section of a washing machine, Spinning section, Automatic washing machine, Fault finding, Servicing, Precautions.

- 9) Electric Gieser : Types of gieser, Fault finding, Repairing & testing.
- 10) HPMV Lamp : Connection of High Pressure Mercury vapour Lamp. To study light electronic changer.

Diploma in Automobile Technician Syllabus

	Particulars	Credit Points
AT 101 -	Two Wheeler Repair (Theory)	8
AT 102 -	Two Wheeler Repair (Practical)	8
AT 201 -	Four Wheeler (Theory)	8
AT 201 -	Four Wheeler (Practical) -	8

Syllabus of Diploma in Automobile Technician Four Wheeler Course.



- 01) Safety Precaution Rules
- 02) First Aid and First Aid Methods
- 03) Fire extinguishers
- 04) Skilled Workers
- 05) Tools & Equipments
- 06) General information about four wheeler
- 07) Classification of Four Wheelers
- 08) Gasket and Gasket material
- 09) Locking Devices
- 10) Wheel
- 11) Tyre and Tube
- 12) Frame of Four Wheeler
- 13) Suspension System
- 14) Shock Absorber
- 15) Front Axle
- 16) Steering System
- 17) Steeing Geometry
- 18) Brake System
- 19) TRansmission System
- 20) Clutch
- 21) Gear Box
- 22) Drive Line
- 23) Differential Unit
- 24) Rear Axle
- 25) Engine
- 26) Cooling System
- 27) Lubrication System
- 28) Fuel supply Sysystem of Petrol Engine



- 29) Carburetor Air Cleaner
- 30) Ignition System
- 31) Power System

Syllabus of Two Wheelers

- 1) Two Wheelers :- Types, Assembly & Worki
 Unit 1 : Assembly & Specifications
 (Scooter, Motor-cycle & Moped)
 Unit 2 :- Two wheeler Working & Primary care & maintenance.
- 2) Power System -
 Unit 3 :- Two wheeler Engine : Principle and construction.
 Unit 4 :- Engine Construction
- 3) Fuel System -
 Unit 5 :- Fuel System Carburetor in two wheeler
- 4) Electrical- Ignition & wiring System
 Unit 6 :- Ignition System
 Unit 7 :- Wiring System
- 5) Transmission System : Clutch
 Unit 8 : Clutch Assembly
 Unit 9 : Transmission System
- 6) Two Wheelers Accessories , Cooling & suspension systems
 Unit 10 : Cooling System
 Unit 11 : Accessories of two wheelers.

