# Certificate in Hardware & Networking Administration under SCVT Craftsman Training Scheme

**Eligibility** - 1) 12$^{th}$ Class(Science) pass under 10+2 system or duly recognized Diploma in Engineering from any AICTE approved Polytechnic Diploma of 3 years duration after class 10$^{th}$.

Fees - Rs. 30,000/-

Age - As per the norms of ITI

Duration of Training 52 weeks (1 year) @ 30 hrs per week
- 2 hrs / week Personality Development Sessions
- 2 hrs / week Weekly Exams
- 2 hrs / week Market Survey

Total - 4 hrs / week extra sessions

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30hrs – 6 hrs = 24 hrs of Academic hours per week

Total Practical hrs / week - 12 hrs

Total Theory hrs /week - 12 hrs

Total Duration of the Course - 52 weeks * 24 hrs = 1248 hrs

Total no. of Theory Hours - 624 hrs

Total no. of Practical Hours - 624 hrs

Total no. of Students in a Batch - 16 students

Objective of the Course

1) To prepare students with the latest knowledge in Computer Hardware & Networking

2) To make students directly usable by the Hardware, Network and IT Industry

3) To provide Unemployed youth placement after such courses as IT professional

**Certificate Course in**
**Computer Hardware and Networking Administration**
# SUGGESTED  COURSE  OUTLINE

| TOPICS | COURSE DURATION ( weeks ) | THEORY ( Hrs ) | PRACTICALS ( Hrs ) |
|---|---|---|---|
| **I ) BASIC ELECTRONICS** | **9 WEEKS** | **120hrs** | **120hrs** |
| 1. Basic Electricity | 1 week | 12 | 12 |
| 2. Analog Electronics | 2 weeks | 24 | 24 |
| 3. Digital Electronics | 3 weeks | 36 | 36 |
| 4. Microprocessors | 3 weeks | 36 | 36 |
| | | | |
| **II) COMPUTER APPLICATION** | **10 WEEKS** | | |
| 1. DOS | 1 week | 12 | 12 |
| 2. Windows 98 | 1 week | 12 | 12 |
| 3. MS Word | 1½ week | 18 | 18 |
| 4. MS  Excel | 1½  week | 18 | 18 |
| 5. MS Power Point | 1 week | 12 | 12 |
| 6. Installation, Configuration of Internet | 1 week | 12 | 12 |
| 7. Installation, Configuration of Multimedia | 1 week | 12 | 12 |
| 8. Installation of Operating System | 1 week | 12 | 12 |
| 9. Installation of Application Software | 1 week | 12 | 12 |
| | | | |
| **III) COMPUTER HARDWARE** **& PERIPHERALS** | **15 WEEKS** | | |
| 1. Study & Identification & testing of Parts & cards | | | |
|     a. Processors | | | |
|     b. Mother Board | | | |
|     c. Display Cards | | | |
|     d. I/O Cards | 4 weeks | 48 | 48 |
| 2. Study & Identification & testing of RAM | ½  week | 06 | 06 |
| 3. Assembling of a PC | 1 week | 12 | 12 |
| 4. CMOS Setup | ½  week | 06 | 06 |
| 5. Installation & Configuration of FDD  &  CDD | 1 week | 12 | 12 |
| 6. Installation & Configuration of HDD | 1 week | 12 | 12 |
| 7. Key Board & Mouse | 1 week | 12 | 12 |
| 8. Printers – DM & Inkjet | 1 week | 12 | 12 |
| 9. Monitors – Mono & Colour | 2 weeks | 24 | 24 |
| 10. SMPS | 1 week | 12 | 12 |
| 11. PC Trouble Shooting | 2 weeks | 24 | 24 |
| | | | |
| **V) NETWORKING** | **16 WEEKS** | | |
| 1. Networking Fundamentals | 1 week | 12 | 12 |
| 2. Network Components | 1 week | 12 | 12 |
| 3. Netware 5 | 5 weeks | 60 | 60 |
| 4. Windows 2000 | 5 weeks | 60 | 60 |
| 5. Linux | 4 weeks | 48 | 48 |

NOTE – 2 weeks are reserved as buffer to hedge against un foreseen circumstances, revision, and preparation for final examination.

# I ) BASIC ELECTRONICS ( 7 WEEKS )

**1.**    **Basic Electricity**                    **1 week**
- conductivity
- Voltage, Current,
- Series & Parallel circuits

**2.**    **Analog Electronics**                    **2 weeks**
- Soldering
- Ohm's Law
- Power
- Using Multimeter
- Diode
- Transfomer
- Using of Oscilloscope
- Transistor

**3.**    **Digital Electronics**                    **3 weeks**
- Binary number System
- Hexa Number System
- Octal Number system
- Basic Logic Gates
- NAND, NOR, EX-OR
- D Flip Flop
- RS Flip Flop
- Shift Register
- Counters
- IC 555

**4.**    **Microprocessors**                    **3 weeks**
- Introduction to Microprocessor
- 8085 Pin Configuration
- Interrupts
- Logic and branching operations
- Arithmetic operations
- IC 8155
- IC 8255
- IC 8259

# II) Computer Application  (9 weeks )

**1)**      **DOS**                                      **1 week**
- Installation
- Internal Commands
- External commands
- Making Bootable floppy
- Formatting

**2)**      **Windows 98**                           **2 weeks**
- Desk Top Management
- Windows explorer
- Control Panel
- Task / Menu bar
- Add/remove programs
- Wall Papers and Screen Saver settings
- Add new hardware
- System configuration

**3)**      **MS Word**                               **1½ week**
- Type text
- Insert Menu
- Edit menu
- Format  menu
- Tools
- Tables
- Mail merge
- Creating Hyper link

4)      **MS  Excel**                             **1½ week**
- Creating work sheet
- Insert Menu
- Edit menu
- Format  menu
- Tools
- Tables
- Creating the Graphs

**5)**      **MS Power Point**                      **1  week**
- Creating Presentation
- Edit menu
- Format menu
- Slide Show

-      Inserting Photo, Audio, and Movie


6)      **Installation, Configuration of Internet        1 week**
-      installation and connecting of Computer with Modem and Tel. lines
-      Internet browsing
-      E-Mail sending and Receiving


**7)      Installation, Configuration of Multimedia      1 week**
-      Installation and Cinfiguration of Sound card
-      Configuring the computer for Audio and Video CDs
-      Installation of various Audio and Video Utilities like WinAmp, Sonic,etc..


8)      **Installation of Operating System              1 week**
-      Installation of Windows 3.x
-      Installation of Win 95
-      Installation of Win 98
-      Installation of Win ME
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**9)      Installation of Application Software      1 week**
                    -      Installation  of office-97
                    -      Installation  of office-2000

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# III) COMPUTER HARDWARE  & PERIPHERALS
# (15 WEEKS)

**1)      Study & Identification & testing  of Parts & cards      4 weeks**
- a. Processors
  Definitions of processor, Bus speed,
  Study & Identifications of 8086, 80286, 80386, 80486, P I, P II, P III
  Study & Identification of different Processor Sockets
- b. Mother Board
  Study & Identification of I/O Slots
  Study & Identification of BIOS
  Study & Identification of I/O Ports
  Study & Identification of FDC & IDE Channels
- c. Display Cards
  MDA
  CGA
  VGA
  SVGA
- d. I/O Cards
  I/O CARD
  MULTI I/O CARD
  IDE CARD
  SUPER IDE CARD
  INTERNAL MODEM
  SOUND CARD
  NIC CARD

**2)    Study & Identification & testing of RAM                ½  week**
Different types of RAM
EDO , FAST-PAGE, SDRAM, RDRAM
Study & Identification of different slots of RAM

**3)    Assembling of a PC                                    1 week**

Mounting of the Motherboard
Connecting the different Ports & Connectors of FDD & IDE
Inserting the different I/O cards on the Motherboard
Connecting the SMPS to the Motherboard

**4)    CMOS Setup                                           ½  week**
Study of Different types of BIOS
Flash BIOS
Study of Functioning of BIOS
Configuring of different devices through CMOS

**5)    FDD  &  CDROM                                        1 week**

Study of Working of FDD
Configuring of the FDD as A & B Drive
Identification of different parts of FDD
Identification of the different parts of CDROM
CDROM Installation

**6)    Installation & Configuration of HDD**                    **1 week**

      Logical Section of HDD
      Physical Sections of HDD
      Parts Identification of HDD
      Master-Slave Configuration of HDD
      Partioning of HDD
      Data Recover Utility of HDD


**7)    Key Board & Mouse**                                       **1 week**

      Study & Identification of Different types of Keyboard
      Mechanical, Membrane ,Opto-Electronic etc
      Study of Different types of Mouse
      Mechanical, Optical, Opto-Mechanical

**8)    Printers – DM & Inkjet**                                  **1 week**

      Types of Printers
      Impact & Non-Imapct Printers
      Working of Dot-Matrix Printer
      Installation of Dot-Matrix Printer in Windows-9X
      Identification of Different parts of Dot-Matrix Printer
      Working of Ink-jet printer
      Identification of Different of Ink-jet Printer


**9)    Monitors – Mono & Colour**                               **2 weeks**
      Study of Monochrome Monitor
      Tracing of Monochrome Monitor
      Voltage Measurement of Monochrome Monitor
      Troubleshooting of Monochrome Monitor
      Study of Color Monitor
      Tracing of Color Monitor
      Voltage Measurement of Color Monitor
      Troubleshooting of Color Monitor


**10)   SMPS**                                                    **1 week**

      Study of Linear Power Supply
      Study of Switch Mode Power Supply
      Parts Identification of SMPS
      Tracing of Smps
      Voltage Measurements of SMPS
      Troubleshooting of MSPS


**11)   PC Trouble Shooting**                                     **2 weeks**
      Different Error signals generated by BIOS
      Problems in PC due to the Display Cards
      Problems in PC due to the cables & connectors

# V) NETWORKING (16 WEEKS)

**1)**          **Networking Fundamentals**          **1 week**
Terminologies Client, Server, Topology, Technology etc
Types of Network
Hierarchical Central Computer,Peer to Peer Network, Client Server Network
Types of Network Topologies
Types of Network Technologies
Types of Data passing Schemes

**2)**          **Network Components**          **1 week**
Types of Cablings
Coaxial, UTP, STP, FOC
Types of Connectors
RJ-45, Terminator, T-Connector, BNC
Define HUB, Switch, Router

**3)**          **NOVELL Netware 5**          **8 weeks**
Installation of Novell Netware server
Installation of ZEN Client
Connectivity between Server & Client
User Creation & Administration
Directory Rights
NDS Rights
Login Script
Drive Mapping & Search Drive Mapping
Network Printing
ZEN Works
DHCP Server
DNS Server

**4)**          **MICROSOFT Windows 2000**          **8 weeks**
Installation of Windows 2000 Proffessional
Installation of Windows Advanced Server
User Creation & Administration
Advanced Directory Services
Local Profile & Roming Profile
Installation & Configuration Of DHCP Server
Installation & Configuration of WINS Server
Installation & Configuration of IIS
Installation & Configuration of RAS

**5)       Linux                                                          4 weeks**

Installation of Red Hat Linux 7.0
Installtion of Linux with windows 9X
Installation of Linux with windows 9X & windows NT
User Creation & Administration in Linux
Accessing FDD & CDROM & HDD in Linux
Configuration of TCP/IP in Linux
Connectivity of Linux with Windows 9X & Windows NT
Installation & Configuration of NFS Server
Installation of software packages in Linux
Installation & Configuration of DHCP Server
Connecting to the Internet in Linux
Linux Security
Installation of DOS Emulator & Windows Emulator in Linux

Minimum Furniture and infrastructural facility required to conduct training for
# Certificate course in Computer Hardware and Network Administration

1) Neat and Clean premises duly painted .
2) Cold drinking water facility available
3) Toilet facility available, separate for ladies and gents
4) Classrooms and Lab facility available as per the requirement of the course
5) Proper lighting and ventilation provided
6) Proper storage facility available to store the components, meters , etc
7) "A" class electrical line laying done wit proper Earthing to avoid hazards.

## Requirements of Class room to conduct Theory Sessions

Batch Size – 16 students in class and 16 students in Lab making 32 students in one time slot.
Requirement to conduct 4 batches per day

1) Tables (with sunmica top To accomodate 2 students per table )    -   16 nos.
2) Chairs ( with castor, cushion, and adjustable height ) -        32 nos.
3) White Board & marker pens                    -        1no.
4) Air conditioner                      -        2 nos.
5) Fans(Celing /Wall/Pedestal)                  -        2 nos.

1)    **Equipments required to conduct practicals for Basic Electronics subject.**

- Analog/ Digital Trainer Kit – 8 nos
  (With the facility of variable power supplies, frequency generator, bread board,
  sine/square/trianqular wave generator.)
- Component Boxes – 8 nos.
- Microprocessor Trainer Kits – 8 nos.
- Digital Multimeter – 8 nos.
- Analog Multimeter – 4 nos.
- Panel Meters
     i. 0-1ma – 2nos
    ii. 0-10ma – 2 nos
   iii. 0-100ma – 2 nos.
- Oscilloscope – 2 nos – 20 Mhz, single/double trace.
- Soldering Iron – 8 nos
- Desoldering Pump – 8 nos.
- Tool kit – 2 nos.

2**) Equipments required to conduct practicals for Computer Application and Networking
     Subjects**

- **Server - 1 no.** – P-III –500Mhz / 10GB HDD / 1.44 FDD / 101 key Board / Mouse / 52x CDD / NIC / SVGA Monitor / MM kit
- **Nodes – 8 nos**. – P-II – 500 Mhz / 10 GB / SVGA Monitor / NIC / KB / Mouse /
- **Printer –** Dot Matrix and Ink Jet
- **Modem –** Internal or External
- **Hub –** 16 port HUB with LAN wiring and Cabling
- **Over Head Projector**

3) **Equipments required to conduct practicals for Computer Hardware Topics**

- Working Old computers 386 / 486 /p-1/ etc – 8 nos
- Working /Non working Display Cards, I/O cards, NICards, etc – 8 nos. each
- Working/Non working Printers – 2 nos
- Working/Non working FDD, HDD, CDD – 2 nos each

**4) Legal Softwares**
- Operating System – win 95/98/me for all machines
- Novell Netware
- Microsoft Win 2000
- Anti Virus Packages
- Ms Office

**5) Other Requirements**
- Ups-1 Nos- 500VA(for Server)
- Stabilized Power Supply

**6) Faculty Qualification**
- Diploma in Computer Science/Computer Application/Computer Technology (2 years OR more) by any Institution approved by AICTE. OR BCA (3 year course) or MCA or BE (Computer Science) from any recognized university.

   In addition to above, the faculty should have minimum 3 years of teaching experience in any reputed Computer Institute in respect of topics covered in the course.

**7) Faculty Requirement**
- **FOR ONE BATCH** Minimum 2 faculties are needed with above qualification for 1 batches each of 16 students. (1 Faculty for theory and 1 faculties as a lab coordinator )
   **FOR TWO BATCHS** Minimum 3 faculties are needed with above qualification for 2 batches each of 16 students. (1Faculty for theory and 2 faculties as a lab coordinator )