Main Features of Curriculum

1. Title of the course   : Computer Hardware Maintenance & Networking
2. Duration of Course   : Six Months
3. Type of the course   : Full time
4. Admission Qualification : Knowledge of English & Basic Computer

CURRICULUM
SIX MONTHS
CERTIFICATE COURSE
OF
Computer Hardware Maintenance & Networking

SUBJECT
MODULE I   6 WEEKS
1. Computer Hardware
2. Basics of Electronics & Measuring Instruments
MODULE II   7 WEEKS
3. Operating Systems
4. Computer Maintenance
MODULE III   7 WEEKS
5. Computer Networking
6. Network Administration

STUDY & EVALUATION SCHEME
FOR
CERTIFICATE COURSE
Computer Hardware Maintenance & Networking
(Effective from ....)

| S.No | SUBJECT | PERIOD PER DAY | | EXAM SCHEME | |
		THEORY	PRAC	PRAC EXAM DUR	TOTAL MARKS
	MODULE I **6 WEEKS**				
1.	COMPUTER HARDWARE	01	03	03	50
2.	BASICS OF ELECTRONICS & MEASURING INSTRUMENTS	01	01	03	50
	MODULE II **7 WEEKS**				
1.	OPERATING SYSTEMS	01	02	03	50
2.	COMPUTER MAINTENANCE	01	02	03	50
	MODULE III **7 WEEKS**				
1.	COMPUTER NETWORKING	01	02	03	50
2.	NETWORK ADMINISTRATION	01	02	03	50
	TOTAL **20 WEEKS**	02	04		300

NOTE: (1) Each period will be of 50 minutes duration.
   (2) Each session will be of 24 weeks.
   (3) Effective teaching will be atleast 20 weeks.
   (4) Remaining periods will be utilised for revision etc.
   (5) Emphasis should be on Practical Aspect.

1.COMPUTER HARDWARE

1.BASIC COMPUTER SYSTEM & PERIPHERALS: –
   Input & Output Devices, their types and specifications, CPU, Memory devices- types- primary and secondary.
2. MOTHER BOARD: .
   Study of Motherboard RAM, ROM, CMOS, POST, BUS, (Address, Data, SYSTEM) Connections of various devices such as Display Adapter, Ports (Serial, Parallel, USB)& Modem on the Mother Board. Importance of CPU cooling, Motherboard troubleshooting.
3. SERIAL DEVICES:- a. Key Board: Switches, Keyboard organization, Key board type, Wireless Keybaord Trouble shooting.
   b. Mouse: Mouse type- Scroll & Optical Mouse, Function Connecting Mouse, Trouble shooting Mouse.   c. Ports d.Modems
4. STORAGE DEVICES:-
   a. HDD: HDD types, integrated, SCSI, , Formatting (Track, Sector) Defragmentations , Bad Sector, Jumper Setting, Common Problem and its trouble Shooting, External Drive (HDD), Optical Drives.
   b.FDD: FDD types and working and its related problem.
   c CD and DVD drives- ROM and Writer, COMBO drives, , Mass Storage Devices.
   d.USB Devices:- Hub,Pen Drives
5. PARALLEL DEVICES:-
   a. Printers: Working of DMP, Ink Jet, Laser Printer, line printer, MFP (Multi Functional Printer) and its Trouble shooting.
   b.Scanners- Working method and its trouble shooting.   c.Plotters .

List of Practicals
1. Study & Trouble Shooting of
   (I)   Devices on motherboard
   (II). Key board & Keyboard decoder
   (III) Video Adopter & Display Controllers
   (IV) Floppy Drive, CD,DVD,pen Drive and Hard Disk.
   (V)   Multifunction Input/Output controllers
2. Troubleshooting & repair of following equipment
   (I)   Monitor   .
   (II) Dot Matrix Printer, Laser, Inkjet Printer.
   (III) C. P. U.
   (IV) Disk Drive
   (V)   Scanner

2. BASICS OF ELECTRONICS & MEASURING INSTRUMENTS

1. PASSIVE COMPONENTS- Resistors, Capacitors, Inductors, Transformers – Types, Working and Properties. Voltage and Current Sources.
2. SEMICONDUCTOR PHYSICS
2.1, Types of semiconductors
2.2 Pure (intrinsic) semiconductors-Silicon, Germanium: p-n junction.
3. SEMICONDUCTORS DIODES:
3.1 Half wave rectifier, Full wave rectifier using C.T. transformer, using bridge circuits)
3.2 Special purpose diodes: Zener diode, Vractor diode, Photo Diode, Light emitting Diode (LED), their characteristics and uses.
4 TRANSISTOR:
4.1Types,Working Various configurations of transistor (CB,CE, CC); configurations;
4.2 Field - Effect transistor (JFET, IGFET, MOSFET), Photo Transistor
5. INTEGRATED CIRCUITS:
5.1 Introduction; SSI, MSI, LSI, VLSI, ICs;
5.2 Linear and Digital ICs;
5.3 Switching and Gating ICs;
6. REGULATED POWER SUPPLY
   1. Basic regulator using Zener Diode
   2. IC based power supplies Block diagram major specification, pin configuration their measurements
   3. Basic of switch mode power supply (SMPS)
   4. Basic of uninterrupted power supply
   5. Concept and Practices of Earthing
7. BASIC MEASURING INSTRUMENTS
7.1 Multimeters – Electronics & Digital – Basic principles of measurement & significance of specifications

List of Practicals:-

1. Identifications of types of packages, terminals and noting different ratings using data books for various types of.
   Semiconductor diodes (Germanium, point contact, silicon low power and high power and switching diode), Zener diode, Transistor Biasing circuits, FET,MOSFET .LED,Varactor Diode,Photo Diode
2. Identification of some popular IC of 74 and 40 series with pin number and other details.
3. Use of Multimeters – Electronics & Digital

3. COMPUTER MAINTENANCE

1. TYPES OF SOFTWARE- System Software, Application Software, Driver Software, Software Installation,Windows and other S/W , Anti Virus S/W.
2. BOOT PROCESS : Features & Setting of CMOS, Setup
3. POWER SUPPLY : Operating characteristics, Types and maintenance.Trouble Shooting
4. MONITOR : Types and maintenance.Trouble Shooting
5. TYPES OF PC'S : Desktop. Laptop. Palmtop. BIOS/ CMOS setting.
6. PC Assembling
7. PC TOOLS
8. Upgradation of old computers

List of Practicals

1. Study and Trouble Shooting of
(I) Network
(II) Power Supplies.
2. Assembly of PC
3. Upgradation of old computers
4. Cleaning Practices

4. OPERATING SYSTEM

1. INTRODUCTION -What is O.S., Multiprogramming, Time Sharing, Real Time System, and Multitasking.

2. FILE SYSTEM : Types of file Sequential, index, direct access, creation and updates of file and access method. Directory system.

3. C.P.U.& DISK, Drum Scheduling. Scheduling concepts, Scheduling Algorithm, Multiprocessor, FCFS Scheduling.

4. MEMORY MANAGEMENT Swapping, multiple partitions, Paging, Segmentation, virtual memory , Demand paging, page replacement.

5. FEATURES OF WINDOWS- Types of Window – XP/ 2000/Vista & differences, Boot Process, Configuring, Installation, GUI, What is interface, Windowing, windows environment, menus of Dialog boxes, Concepts of Icon, Basic Windows Security System. Functions of Programs, Documents, Setting, Run Command.

6. LINUX – Installation, File System, Tools and Commands, RHL. LAMP

List Of Practicals

1. Exercise on Widows XP/2003/VISTA
2. Examination of corrupt systems
3. Exercises on Linux.
4. Installing Drives
5. Detail Study of " MANAGE" Computer

5. COMPUTER NETWORKING

1. Types of Network-LAN,MAN,WAN,

2. TRANSMISSION MEDIA : STP (Shielded Twisted Pair), UTP (Unshielded Twisted Pair) ,Coaxial Cable, Cabling Standards for LAN using UTP Cable, How to do Crimping, Building Straight Through Cable and Cross Cables, Testing Cable Continuity.
  Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves and their respective connectors, IEE standards.

3. PROTOCOLS AND ARCHITECTURE: OSI reference models, TCP/IP Protocol suit.

4. DATA LINK CONTROL AND PROTOCOL: Flow Control - Stop and Wait, Sliding window, Error Detection, by parity & CRC, Error connection, humming code, HDLC.

5. LOCAL AREA NETWORK : LAN architecture, LAN topologies - Bus/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMS/CD), Token Bus, token ring and FDDI.

6. NETWORKING DEVICES- Hub, switch, Bridge, Routers, Repeaters, gateways, Modems.

7. NETWORK LAYER- Introduction , Routers, Routing Algorithms, Congestion, Sub networking and Class Less Inter Domain (CCIDR),
 NAT and PAT, Control algorithm, IP Addressing, DNS, Working of Internet- Web Server, Browser, HTTP, HTTPS, Web Services, Internet Architecture, IIS, Web Application.N/w Security – Cryptography.

8. TRANSPORT PROTOCOLS: Transport services, TCP, UDP.

9 WIDE AREA NET WORKS: WAN, Circuit switching, Packet switching, Frame relay, ATM, ISDN.

List Of Practicals

- 1. To connect computers in different ways in a LAN (Topologies-star, ring, bus, tree)
- 2. To connect and understand different network devices used in LAN- Hubs, Switches, Routers, Bridges, Repeaters, Gateways, Modems.
- 3. To study the constructional details of transmission media- co-axial cables, twisted pair cables, optical fibre cable.
- 4. To create network cable using RJ 45 connectors.
- 5. Connections of two hubs by creating cross over connections.
- 6. To install a network interface card (NIC)
- 7. To install TC/IP protocol and configure its advance property.
- 8. To locate MAC address of computer.
- 9. To Install network printer.
- 10. Installing IIS, making web server, web directory, connection via remote desktop, to know browsers.
- 11. To identify different problems of network exm- no network, card problem, cable problem, IIS problem.

6. NETWORK ADMINISTRATION

1.Introduction to Windows 2000, Professional and Windows 2003 server, Installation & configuration of Windows 2000 professional, Installation & configuration of Windows 2003 server.

2. User & Group Managements, NTFS & share permissions. Using device manager, Drivers signing& signature verification. Managing Ports, Installing & Managing & configuring printers. Disk Management Tools & Tasks, File Systems, User Management. Installing Active Directory.

3. Domain user account, configuring user account properties. Domain groups. Viewing a user's effective permission. Creating and managing shares. Implementing files and folder NTFS & share permission, Special permission, inheritance. Implementing Shadow copies. Implementing and Managing the Distributed File system(DFS). Auditing Access to Resources.

4. Installing and Configuring Terminal Services. Managing servers remotely using terminal services (Remote desktop). Backup restoring data.

5. Installing DNS. Implementing DNS in windows 2003 networks.

6. Installing and configuring DHCP. Monitoring and Managing Internet information services (IIS 6.0) Remote Access server. Configuring & Implementing VPN. Configuring & Implementing Remote Access services.

7. Configuring & Implementing routing services. Configuring & implementing ICS. Active directory services. Implementing active directory services forest.

8. Planning implementing an OU structure. Implementing server roles. Restoring active directory.

9. Local and domain security policies. Working with group policy. Configuring the user environment by using group policy. Deploying software through group policy.

List Of Practicals
1.Installation & configuration of Windows 2000 professional.
2.Installation & configuration of Windows 2003 server.
3.Installing and Configuring Terminal Services
4.Installing DNS. Implementing DNS in windows 2003 networks.
5.Installing and configuring DHCP.
6.Configuring & Implementing routing services

Tools & Equipment

Hardware:

- Multimedia Computer System with internal Modem
- External Modem
- Laser Printer
- Desk Jet Printer
- Dot Matrix Printer 132 Cols.
- CD Writer (1 – Internal; 1 – External)
- Computer repairing tool kits
- Vacuum Cleaner (small size)
- Soldering Station
- Spare Motherboards, Processor & Memory Modules
- Expansion Cards used in computers
  (SCSI, TV Tuner, Ethernet)
- Networking tools such as Hub, Switch, Modem, Router, crimping tool, etc

Software:

- Microsoft Windows 2000 (Professional) or Linux OS Latest
- Microsoft Windows XP or any other Word Processor software
- MS DOS (Ver. 6.2 or latest)
- Windows 2003 Server.
- Antivirus Software (Popular Brand)
- Norton Utilities
- Hardware Diagnostics software
  (Advanced MS Diag. / QA Plus)

Material
- FDD Head –cleaning kits
- CD Lens cleaning kits
- Carbon tetra chloride
- Isopropyl alcohol