

CSC 208

2 units

INTRODUCTION TO HARDWARE

LABORATORY

COURSE OUTLINE

- 1) Identify & describe of tools for Computer Service ✓
- 2) Identify & describe various internal components of a computer
- 3) Assemble a Computer System ✓
- 4) Install an Operating System ✓
- 5) Describe the purpose of preventive maintenance and basic troubleshooting steps;
- 6) Troubleshoot using system tools & diagnostic software
- 7) Main Components of Laptop & portable devices, basic preventive maintenance, and troubleshooting
- 8) Differences between Printers & scanner, installation and configuration, basic preventive maintenance & troubleshooting

Tools And Equipment in Computer hardware Services

* Hand tools in Computer hardware servicing

* Tool. A handheld device that aids in accomplishing a task.

Safe Use of Tools

Environment, Safety & health program requires the

following:

- 1) All tools be kept in good condition with regular maintenance
- 2) The right tool be used for the job
- 3) Each tool should be examined before use AND damages or defective tools shouldn't be used.
- 4) Tools should be operated according to manufacturer's instruction
- 5) The right protective equipment for the tool and activity should be used

Hardware Tools

- 1) Electrostatic Discharge (ESD) Tools
- 2) Hand Tools
- 3) Cleaning Tools
- 4) Diagnostic Tools

1) Electrostatic Discharge (ESD) Tools

- Using Anti static wrist strap
- Anti static mat

2) Hand Tools

→ Flat head screwdriver To loosen or tighten slotted screws

→ Phillips head screwdriver To loosen or tighten cross head screws

- Torx Screwdriver - Star-like depression serves
- Hex driver L to tighten nuts. sometimes calls nut driver
- Needle-nose pliers - used to hold small parts
- Wire cutter - To strip and cut wires
- Tweezers - To manipulate small parts
- Part driver L to retrieve parts from location that are small for your hands to fit.
- Flashlight L To light up area that one can see

3) Cleaning Tools

- Lint-free cloth L To clean different computer components without scratching or leaving debris
- Compressed air L To blow away dust and debris from computer parts without touching them
- Cable ties L To bundle cables neatly ins out
- Parts organizer L To hold screws, jumpers, fasteners and other small parts preventing them from mixing together

4) Diagnostic tools

- MULTITESTER — Digital & analog multimeter
- Loopback Adapter L To test functionality of Computer Ports.

ACTIVITY

State True or False

- 1) Selecting the best tool for each task requires training in the proper use of the tools, field experience in their safe use, and following the manufacturer's guidance & instruction for that specific tool. TRUE

- ② When obtaining the tool, all the associated tooling and Consumable parts, as recommended by the manufacturer, must be included. TRUE
- ③ The safe use of a tool depends on using the tool for the purpose for which it was designed and also for other purposes where it can be used as substitute where tool is not available FALSE
- ④ All tools should be kept in good condition with regular maintenance TRUE
- ⑤ Preparing for a task includes only knowing the task to be done FALSE

LAB 1

COMPUTER HARDWARE

What is inside your computer

- ① System fan ② Floppy ③ Heat sink ④ Hard drive
- ⑤ Power supply ⑥ Optical Drive ⑦ Motherboard ⑧ Processor (CPU)
- ⑨ RAM module

HARDWARE

- Physical Parts of Computer

- Anything you can touch & see

- Motherboard, Internals, Chassis, monitor, keyboard, mouse etc

Case - Chassis - Protects all Components of a Computer

Proves air flow

Noise insulation

Power Supply (Provides Power to Computer hardware
PS Connectors.

- ① Molex Connector (standars) 4 Pin
- ② SATA Connector
- ③ Floppy Connector
- ④ CPU Connector 4+4 Pin
- ⑤ Motherboard Connector 20+4 Pin
- ⑥ PCIe Connector 6+2 Pin

Motherboards : A printed circuit board which holds the crucial components of the system

ATX, mini-ATX and Micro-ATX are motherboards formats

Chipset, Components which are connected to the motherboard are connected & controlled by the chipset usually composed of Northbridge & Southbridge chip

Peripheral Device : A device that connects through an external port to your computer connection types.

- ① PS/2
- ② USB
- ③ Firewire
- ④ Serial
- ⑤ Parallel
- ⑥ PC card (PCMCIA)
- ⑦ PCI Express

SATA Drive - has Card-edge Connector
PATA Drive - has Pin Connector

Operating System Installation.

* Dual-boot : A way of using two or more different O.S on a single computer. Each O.S is installed on a separate Partition on the main hard drive.

* Partitioning

Partition is a section of the hard drive that is separated from other segments.

* Formatting

Disk formatting is the process of preparing a data storage device such as hdd, sdd, floppy disk, memory card or USB flash drive for initial use.

Formatting involves 3 different processes.

i) Low-level formatting : done at the factory

ii) Partitioning : divides a disk into one or more regions containing data structures to the disk to indicate the beginning and end of the regions

iii) High-level formatting : creates the file system format within a disk Partition or a logical volume.

PARTITIONING

A process of dividing the device into several sub-devices each of which is treated by the O.S as a separate device and, in some cases, to allow an O.S to be booted from the device.

Computer Maintenance And Troubleshooting

Maintenance

The practice of keeping computers in a good state of repair, through regular cleaning, hard drive updates, and virus prevention.

Types Of Maintenance

- ① Preventive maintenance ② Corrective maintenance.

PREVENTIVE MAINTENANCE

- 1) Proper positioning of the computer system
- 2) Always place the system in a place that is properly ventilated
- 3) Dust the system with a lint-free cloth
- 4) Ensure proper system shutdown
- 5) Scan the system using diagnostic tools e.g. CHKDOSk

Diagnostic tools are used to diagnose and repair computer. It can be hardware diagnostic tools or software diagnostic tools.

Hardware diagnostic tools :- ① Power Supply tester ② POST card
③ Loop-back plugs ④ Multimeter ⑤ Cable tester

Software diagnostic tools :- ① Anti-virus program ② Resource Monitor
③ HODScan ④ CHKDOSk ⑤ Scandisk ⑥ Defrag ⑦ FDISK

⑧ DEFRAGMENTATION: The process of reorganizing the data

stored on the hard drive so that related pieces of data are put back together, all lined up in a continuous fashion. It increases computer performance.

- ⑦ Using thunder Arresters or lightning Arresters
- ⑧ System Reinstall (Windows)
- ⑨ Using Proper Power backup and data backup.

CORRECTIVE MAINTENANCE

- 1) Virus scan
- 2) Reinstallation of Operating System after backup
- 3) Changing of faulty Components
- 4) Changing the Motherboard.

* check for dry joints

DEFINITIONS

- * Preventive Maintenance is defined as the proactive maintenance of equipment before a fault or failure occurs
- * Corrective Maintenance is performed after system failure
- * Troubleshooting is isolating the source of a problem and fixing it.