

1.5 COMPUTER WORKSHOP

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RATIONALE

The diploma holder needs to understand computer fundamentals and information technology. They should be able to operate basic software related to computer. This course is to provide the students a clear exposure of types of computers, computer components and interfaces, input/output devices and Installation/assembly.

COURSE OUTCOMES

At the end of the course student will be able to

- CO1: Identify and Handle various hardware components
- CO2: Install different types of software and use them appropriately
- CO3: Assemble computer components
- CO4: Interface various devices to PC/Laptop
- CO5: Troubleshoot and Maintain PC/Laptop

PRACTICAL EXERCISES

UNIT I

Introduction

Anatomy of a Computer, Foundations of Modern Information Technology, The Central Processing Unit, How Microprocessors and Memory Chips are Made, Memory, Buses for Input and Output, communication With Peripherals.

Desktop: Identification of desktop and its parts, Hardware, Software and Firmware

Introduction to Mother board, IO and memory expansion slots, Drives, front panel and rear panel

Processors& Bus: Introduction and types of Processor, Introduction to BUS

Laptop: Introduction to Laptop, advantages over Desktops

Laptop components: Adapter – types, Battery – types, Laptop Keyboard and Touchpad

Power Supply: Introduction to online and offline UPS, Difference between online and offline UPS

SMPS: Introduction to SMPS, Study of SMPS Connectors

UNIT II

Memory Storage Devices

Primary Memory: Introduction and types of primary memory (SDRAM, DDR RAM)

Secondary Storage: Hard Disk –Working Principle of IDE, HDD Partition – Formatting, Introduction to SATA and Solid-State Drives (SSD)

Removable Storage: Introduction to CD, DVD, reading & writing operations; Introduction to Blue-ray devices

Flash memory: Flash drives (pen drives), Memory cards and its types

UNIT III

I/O Devices and Interfacing

Inputting Text and Graphics, State of the Art, Input and Output, Pointing Devices, Foundations of Modern Output, Display Screens, Printers, Foundations of Modern Storage, Storage Media, Increasing Data Storage Capacity, Backing up your Data, The Smart Card

Keyboard: Types of keyboards (wired and wireless Keyboard), keyboards connectors, troubleshooting

Mouse: types, connectors, operation of Optical mouse and Troubleshooting.

Printers: Introduction – Types of printers- Dot Matrix, Inkjet, LaserJet, MFP (Multi-Function Printer), advantages, disadvantages, cables and connectors, Troubleshooting.

I/O Ports: Introduction and identification of Serial, Parallel, USB, HDMI.

Displays: Introduction to LED, LCD and TFT Displays, cables and connectors

Graphic Cards: Introduction to different types of Graphics cards

UNIT IV

Maintenance and Trouble Shooting of Desktop and Laptops

Bios-setup: Standard CMOS setup, Advanced BIOS setup, advanced chipset features, PC Bios communication, upgrading BIOS, Flash BIOS -setup.

POST and BOOTING: Definition, POST Test sequence – beep codes.

Diagnostic Software and Viruses: Computer Viruses, Precautions, Anti-virus Software, Working of Antivirus software's

General troubleshooting of various peripheral devices (printer, pc, laptop, keyboard, mouse, monitor, hard disk)

UNIT V

Assembling and Installation of Hardware/Software

Assembling and Disassembling of PC

Installation and Troubleshooting: Formatting, Partitioning and Installation of OS: Windows and Linux

Installation of peripheral devices: Printers, scanner

Installation of software's: application software, systems software

RECOMMENDED BOOKS

1. Stephen J, Bigelow, "Trouble shooting, maintaining and repairing PCs", Tata McGraw-Hill, New Delhi, 2005.
2. Stanley & Hall, "PC Data Handbook, BPB Publications, New Delhi, 2007.
3. Govindarajulu, "IBM PC and clones Hardware trouble shooting and maintenance, Tata McGraw-Hill, New Delhi, 2007.
4. Scott Muller, "Upgrading and Repairing PCs", Microtech Publications, Dubai, 2006.
5. Ronald L.Krutz, "Interfacing Techniques in Digital Design with Emphasis on Microprocessors", John Wiley & Sons New York, 2004.

SUGGESTED WEBSITES

1. PC Hardware — Open & Free – OLI (cmu.edu)
2. <https://www.classcentral.com/course/build-a-computer-3234> : Free Online Course: Build a Modern Computer from First Principles: From Nand to Tetris (Project-Centered Course) from Coursera/Class Central

INSTRUCTIONAL STRATEGY

This is hands on practice based workshop and topics taught in the class should be practiced in the workshop regularly for development of required skills in the students. This workshop contains five units of equal weight age.