ITEX 121: Computer Maintenance and Troubleshooting

Course: Computer Maintenance and Troubleshooting Code: ITEX 121

Credit Hours: 2 Nature: Theory and Practical

Course Descriptions:

The course helps learners develop fundamental knowledge and understanding relating to computer hardware, Troubleshooting & General PC Problems, Operating system installation and restore and backup.

Objectives/Learning Outcomes:

- Understanding computer hardware
- Understand the computer microprocessor
- Assembling and dissembling of computer
- Familiarity of computing devices troubles and handling
- Operating system installation and restore.
- Safe and smooth operation of computing devices

COURSE	Description	Hours
PC hardware /introduction to Microprocessor	• The PC hardware consisting of input, processing and output sections and basic building components. • Introduction to computer hardware components of mother boards, CPU, chipset, various ports, slots, connectors, addon cards. • Protection of PC hardware, anti-static wrist band, protection and safety devices • Evolution of Microprocessor, architecture of Microprocessor.	2
Primary Memory/ Secondary storage	• ROM, PROM, EPROM, EEPROM, L1, L2 RAM, types of memory, static, dynamic, DRAM, SDRAM, DDR2, DDR3. Virtual memory, Cache memory, Linear & Physical memory, video memory. • HDD like IDE, SATA, e-SATA, SCSI, Introduction to HDD controllers like SCSCI controllers and RAID controllers their requirement and configuration. Backup devices magnetic tape drives, UBS Pen-drives, External HDDs, CDROM, CDRW, DVD, Blue-Ray Discs.	3

Power Supply	• Switched Mode Power supply block diagram, working principles, testing and troubleshooting, power rating, requirement of SMPS wattage depending on parameters like processor, HDDs used.	2
Troubleshooting & General PC Problems	• Introduction, General Troubleshooting rules, Preventive Maintenance. Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS Shortcoming & Compatible Issues, BIOS Troubleshooting, BIOS Upgrades. POST, • Error Code: Beep Code, Post Code, Post Reader Card Basic Memory Concepts: Introduction, Installing Memories, Upgrade Options & Strategies • Printers: Printer Technology, How Printer Works, Attaching Printer, Installing Network Printer Drivers, Common Printer Problems & Solution	6
Operating system Back-up and restore	• system Image backup, backup and restore, freeing up disk space, defragmentation, taking updates, network firewall, spyware and unwanted software protection, • run maintenance, and other operating system security features • Upgrade Options & Strategies • Introduction to FAT/NTFS, difference between FAT/NTFS. data storage and data access principles of FAT/NTFS, FAT and MFT structure, attributes in FAT/NTFS, file management and memory management in FAT/NTFS, data deletion and data recovery Concept. formatting,	3
Practical-1	Study of different types of motherboards.	1
Practical-2	Study of jumper settings on mother boards.	1
Practical-3	Installation of memory modules.	1
Practical-4	Study of Various adapter cards and their functioning and installation.	1
Practical-5	Study of different buses and the number of pins in the different slots corresponding to different buses.	1
Practical-6	Opening the PC and identification and study of its different blocks, disassembling.	1
Practical-7	Study of various units, types of display Graphic cards.	1
Practical-8	Assembly and disassembly of different Desktop /Laptop	1
Practical-9	Identification of all chips and crystals on laptop and desktop motherboard	1

Practical -10	Installation of DVD/USB.	1
Practical-11	Study of faults diagnosis based on different beeps.	1
Practical-12	Configure CMOS, BIOS setup.	1
Practical-13	Installation of hard disk, Partitioning.	1
Practical-14	Installation of hard disk in master and slave mode.	1
Practical-15	How to access the configured space of ISA slot.	1
Practical-16	Installation of Windows NT Server /Linux, clients and practice of using the network 2 Practical-8. Running of Scan disk and Disk defragmenter as part of preventive maintenance	1

References:

1. Learn the Basics of Linux, David Maxwell
2. Laptop Repair Complete Guide; Including Motherboard and Component Level Repair! Garry Romaneo.
3. Laptop Chip Level Repair Classroom Notes, http://laptoprepaircourse.in
4. Computer Basics: Basic Troubleshooting Techniques (gcfglobal.org)