

**COURSE TITLE** : **COMPUTER HARDWARE AND NETWORKING**  
**COURSE CODE** : **6043**  
**COURSE CATEGORY** : **A**  
**PERIODS PER WEEK** : **5**  
**PERIODS PER SEMESTER** : **75/6**  
**CREDITS** : **5**

**TIME SCHEDULE**

MODULE	TOPIC	PERIODS
1	Power supply and I/O devices.	19
2	Motherboard organisation.	18
3	Storage devices and ESD.	19
4	Computer networks.	19
<b>TOTAL</b>		<b>75</b>

Course General Outcome :

Module	GO	On completion of the study of this course the students will be able:
1	1	To understand power supplies used in computer system.
	2	To understand the I/O devices of computer.
2	3	To understand motherboard organisation.
3	4	To understand magnetic and optical storage devices.
	5	To know the basics of electrostatic discharge.
4	6	To understand computer networks.
	7	To understand internet and wireless networks.

*GO - General Outcome*

On the completion of the study the student will be able :

**MODULE I POWER SUPPLY AND I/O DEVICES.**

**1.1.0 To understand power supplies used in computer system.**

1.1.1 To explain the block diagram of an ATX SMPS.

- 1.1.2 To list the advantages of SMPS.
- 1.1.3 To state voltage levels of various SMPS used in computer.
- 1.1.4 To identify AT and ATX power connectors for various components in a PC.

#### **1.2.0 To understand the I/O devices of computer.**

- 1.2.1 To describe I/ O Devices.
- 1.2.2 To describe the display adapter/display controllers used in PC.
- 1.2.3 To explain the display adapters VGA, SVGA, XGA.
- 1.2.4 To state the basics of LED, LCD.
- 1.2.5 To identify the pin configuration of various display adapters.
- 1.2.6 To explain the block diagram of a VGA monitor.
- 1.2.7 To describe AGP, PCI Express (PCIe) and their advantages.
- 1.2.8 To explain the matrix keyboard organization and the method of encoding a key press.
- 1.2.9 To state the concept of keyboard controllers.
- 1.2.10 To identify different keyboard connectors - 5 pin DIN, mini DIN (ps/2), USB.
- 1.2.11 To explain the working principle of optical mouse.
- 1.2.12 To describe mouse connectors - serial, PS/2, USB, wireless.
- 1.2.13 To explain the working principle of scanners (flat bed, hand held) and digital camera.
- 1.2.14 To distinguish between impact and non impact printers.
- 1.2.15 To explain the working principle of different types of printers - dot matrix, inkjet, laser printers.
- 1.2.16 To describe the centronics Interface and USB interface.

### **MODULE II MOTHERBOARD ORGANISATION**

#### **2.1.0 To understand motherboard organisation.**

- 2.1.1 To state different motherboard form factors.
- 2.1.2 To explain the block diagram of ATX motherboard organization.
- 2.1.3 To describe microprocessors based on year of design, coprocessors, speed, address lines, data lines, address space.
- 2.1.4 To describe RAM, DRAM, SRAM, SDRAM, DDRAM, RDRAM.
- 2.1.5 To state memory refreshing.
- 2.1.6 To describe various memory modules - SIMM, DIMM and RIMM.
- 2.1.7 To explain the need for cache memory and its classification.
- 2.1.8 To describe the chipsets and support chips, CMOS chip - CMOS setup – BIOS.
- 2.1.9 To explain the mechanism of POST.
- 2.1.10 To describe various expansion cards - I/O card, graphics card, sound card, network interface card, internal modem.
- 2.1.11 To explain ROM - PROM, EPROM, EEPROM, UVEPROM and EAPROM.
- 2.1.12 To identify firmware.

## **MODULE III STORAGE DEVICES AND ESD**

### **3.1.0 To understand magnetic and optical storage devices.**

- 3.1.1 To describe FAT, boot sector, directory area, data area.
- 3.1.2 To explain various file systems - FAT16, FAT32, New Technology File System(NTFS), High Performance File System(HPFS), Linux file system.
- 3.1.3 To state the terms track, sector, cluster and cylinder of a hard disk.
- 3.1.4 To explain the construction of a hard disk.
- 3.1.5 To state the terms seek time and latency time.
- 3.1.6 To describe hard disk controller.
- 3.1.7 To state the need for formatting.
- 3.1.8 To explain low level and high level formatting.
- 3.1.9 To state the need for partitioning of disk.
- 3.1.10 To describe the procedure and tools of partitioning.
- 3.1.11 To explain the optical recording techniques.
- 3.1.12 To know the trends in optical media - CDRom, CD-R, CD-RW.
- 3.1.13 To compare CD, DVD and blue ray.
- 3.1.14 To know USB drives - pen drive and external hard drive.

### **3.2.0 To know the basics of electrostatic discharge.**

- 3.2.1 To state the term ESD.
- 3.2.2 To describe the causes of ESD.
- 3.2.3 To describe the types of ESD - spark, corona discharge and brush discharge.
- 3.2.4 To describe the methods for preventing ESD.
- 3.2.5 To describe antistatic devices - ESD wrist strap, antistatic bag, antistatic mat and antistatic spray.

## **MODULE IV COMPUTER NETWORKS**

### **4.1.0 To understand computer networks.**

- 4.1.1 To state the need for networking and components of networking.
- 4.1.2 To explain ISO-OSI 7 layer reference model.
- 4.1.3 To explain different network topologies - star, ring, mesh, tree and bus.
- 4.1.4 To distinguish different networks - LAN, MAN and WAN.
- 4.1.5 To describe various guided transmission medias - coaxial, twisted pair and optical fibre.
- 4.1.6 To describe various unguided transmission medias - satellite and microwave.
- 4.1.7 To explain dial-up modem and cable modem.
- 4.1.8 To explain the operation of hub and switch.
- 4.1.9 To explain the structure and ISO-OSI 7 layer models of router, bridge and gateway.

## **To understand internet and wireless networks.**

- 4.2.1 To describe the concept of Internet and applications.
- 4.2.2 To explain TCP/IP protocols architecture.
- 4.2.3 To describe the concept of e-mail, World Wide Web and WML.
- 4.2.4 To explain Digital Subscriber Line (DSL).
- 4.2.5 To explain Virtual Private Network.
- 4.2.6 To explain the Wireless LAN Standards - architecture and service.
- 4.2.7 To describe infrared LAN, spread spectrum LAN, and narrowband microwave LAN.
- 4.2.8 To describe the concept of wireless access point, wireless node, Wi-Fi and Bluetooth.

## **CONTENTS**

### **MODULE I Power supply and I/O devices**

SMPS - block diagram - advantages - voltage levels of various SMPS - AT and ATX power connectors - I/O Devices - display adapter/display controllers - VGA, SVGA, XGA - pin configuration - basics of LED, LCD - VGA monitor block diagram - AGP and PCIe - advantages - matrix keyboard organization - method of encoding a key press - keyboard controllers - keyboard connectors - 5 pin DIN, mini DIN (ps/2), USB - optical mouse - connectors - serial, PS/2, USB, wireless - scanners (flat bed, hand held) and digital camera - printers - impact and non impact printers - dot matrix, inkjet, laser printers - centronics interface and USB interface

### **MODULE II Motherboard organisation**

Motherboard - form factors - block diagram of ATX motherboard - comparison of microprocessors - RAM, DRAM, SRAM, SDRAM, DDRAM, RDRAM - memory refreshing - memory modules - SIMM, DIMM and RIMM - cache memory - types - CMOS chip - CMOS setup - BIOS - POST - expansion cards - I/O card, graphics card, sound card, network - interface card, internal modem - ROM - PROM, EPROM, EEPROM, UVEPROM and EAPROM - firmware

### **MODULE III Storage devices**

FAT - boot sector, directory area, data area - file systems - FAT16, FAT32, New Technology File System (NTFS), high performance file System (HPFS), linux file system - hard disk - track, sector, cluster and cylinder - construction - hard disk controller - seek time and latency time - formatting - low level and high level formatting - partitioning - optical recording - optical media - CDRom, CD-R, CD-RW - comparison of CD and DVD - blue ray disk - USB Drives - pen drive and external hard drive - ESD - causes - types - spark, corona discharge and brush discharge - methods for preventing ESD - antistatic devices - ESD wrist strap, antistatic bag, antistatic mat and antistatic spray

## **MODULE IV Computer networks**

Need for networking - ISO-OSI 7 layer reference model - network topologies - star, ring, mesh, tree and bus - networks - LAN, MAN and WAN - guided transmission medias - coaxial, twisted pair and optical fibre - unguided transmission medias - satellite and microwave - dial - up and cable modems - hub and switch - router, bridge and gateway - TCP/IP - concept of e-mail, World Wide Web and WML - digital subscriber line (DSL) - Virtual Private Network - wireless LAN standards - architecture and service - infrared LAN - spread spectrum LAN - narrowband microwave LAN - wireless access point - wireless node - Wi-Fi and Bluetooth

### **Text Book**

1. Troubleshooting, maintaining and repairing PCs - Stephen J Bigelow.
2. Data and Computer Communications - William Stallings.
3. A + Exam Guide - 2<sup>nd</sup> edition - Christopher A Crayton - Course Technology.