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
	TOTAL	**75**

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 - 2nd edition - Christopher A Crayton - Course Technology.