LESSON PLAN 2025-26(WINTER)
NAME OF THE TEACHER : DEEPAK KUMAR BARDA, LECT.(STAGE-II,CSE)
Subject: **COMPUTER HARDWARE& MAINTENANCE(Course Code: TH4)** Program: Diploma in Computer Science and Engineering Semester: 5th sem Total Contact Hours: 60 Total Marks: 100 Assessment: Internal Assessment – 20, End Term – 80
After undergoing the course, the students will be able to: CO1- Know about the manpower engaged in computer centre C02 -Know about the site preparation for computer centre furnishing CO3-Know about the details of Motherboard CO4-Know about the different components of computers C05-Know about the working principles of different I/O devices C06-Assemble the desktop computers C07-Trouble shoot both Desktop and Laptop computers

Class	Topic	Learning Objective	Activity	Homework	Course Objective
Unit 1: Computer Centre Management (8 Classes)				
1	Introduction to Computer Centre Management	Understand why management is essential for the effective operation of a computer center.	Brainstorm potential problems in an unmanaged computer center.	Write a short paragraph on the role of a computer center in an organization or college.	CO1
2	Jobs & Roles	Identify various types of jobs performed within a computer center.	Group discussion to categorize IT jobs (e.g., hardware, software, user support).	Research and list five different IT job titles.	CO1
3	Key Personnel (Part 1)	Define the specific duties and responsibilities of a System Administrator.	Class discussion on skills a System Administrator needs.	Read a sample job description for a System Administrator and list key responsibilities.	CO1
4	Key Personnel (Part 2)	Describe the roles of a Network Administrator and an IT Support Technician.	Role-playing activity: user with a problem and an IT Support Technician.	Create a Venn diagram comparing the roles of a System Administrator and a Network Administrator.	CO1
5	Staff Training	Explain the importance of continuous training for IT staff.	Debate: "Is it more important for IT staff to have certifications or on-the-job experience?"	Research one IT certification and write down what it covers.	CO1
6	Computer Makes & Models	Recognize major computer manufacturers and their product lines.	Show-and-tell with pictures of different computers from various brands.	Visit a computer manufacturer's website and find specifications for one desktop and one laptop.	CO1
7	Case Study & Activity	Apply knowledge of roles to create a basic organizational structure.	Design an organizational chart for a small college's IT department in small groups.	Write a brief justification for the organizational chart created in class.	CO1

8	Unit 1 Review & Quiz	Consolidate and demonstrate understanding of computer center management concepts.	Q&A review session covering all topics from Unit 1.	Study for the upcoming test on Unit 2 topics.	CO1
Unit 2: Site Preparation & Installation (8 Classes)				
9	Computer Centre Layouts	Understand the key principles of designing a safe and efficient computer lab layout.	Analyze diagrams of good and bad computer lab layouts.	Sketch a layout for your ideal home computer setup.	CO2
10	Environmental Control (Structure)	Explain how false roofing and dust proofing protect computer equipment.	Watch a video on data center construction, focusing on structural preparations.	List three reasons why dust is harmful to electronic components.	CO2
11	Environmental Control (Atmosphere)	Describe the importance of air conditioning and humidity control.	Class discussion: "What could happen to a server room if the air conditioning fails on a hot day?"	Research the ideal temperature and humidity range for a computer room.	CO2
12	Introduction to Power Conditioning	Explain why stable, clean power is critical for computer hardware.	Discuss different types of power problems (e.g., blackouts, surges) and their impact.	List home electronic devices most vulnerable to a power surge.	CO2
13	Constant Voltage Transformer (CVT)	Detail the working principle and application of a CVT.	Whiteboard session drawing and explaining a CVT's circuit diagram.	Write a short paragraph explaining the difference between a standard transformer and a CVT.	CO2
14	Uninterruptible Power Supply (UPS)	Explain the function and different types of UPS (offline, online).	Demonstration of a real UPS.	Compare the features and costs of two different UPS models online.	CO2
15	Electrical Safety	Understand the importance of isolation circuits, proper grounding, and other electrical safety measures.	Safety demonstration on how to properly use an anti-static wrist strap.	Create a "Top 5 Electrical Safety Rules" poster for a computer lab.	CO2
16	Unit 2 Review & Design Activity	Synthesize all site preparation concepts into a single design.	Work in groups to create a detailed layout for a small computer lab.	Write a short report justifying the design choices made in class.	CO2
Unit 3: Motherboard and Components (12 Classes)				
17	Introduction to the Motherboard	Identify the motherboard as the main circuit board and understand its basic architecture.	Pass around a motherboard for students to see and touch.	Watch a video on "What is a Motherboard?" and write down three key functions.	CO3
18	Motherboard Components (Part 1)	Identify and explain the function of the processor socket, memory sockets, and BIOS chip.	Use a large, projected image of a motherboard to point out and discuss components.	Draw a simple diagram of a motherboard and label the CPU socket and RAM slots.	CO3

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19	Motherboard Components (Part 2)	Identify and explain Chipsets, Clock Generator, RTC, and power/keyboard connectors.	Interactive quiz to identify components on a projected image.	Research and define the roles of the Northbridge and Southbridge chipsets.	CO3
20	Processors (Intel)	Discuss the evolution and features of Intel processors (Core i3, i5, i7, Xeon).	Create a timeline on the whiteboard showing the progression of Intel processors.	Compare the specifications of a current Core i3 and a Core i7 processor.	CO3
21	Processors (AMD)	Discuss the features of AMD processors and how they compare to Intel's offerings.	Class debate: "Intel vs. AMD: Which is better for gaming? For work?"	Research and list two key features of the latest AMD Ryzen processors.	CO3
22	Chipsets	Take a deeper look at the function of chipsets as the "traffic cops" of the motherboard.	Use an analogy to explain how the chipset directs data flow.	Find a review of a specific motherboard and identify its chipset.	CO3
23	Bus Standards (Legacy)	Explain the function and history of PCI and AGP buses.	Show physical examples of PCI and AGP cards and slots.	Write a short sentence explaining why AGP was developed for graphics cards.	CO3
24	Bus Standards (Modern)	Focus on the features, speeds, and versions of the USB standard.	Group activity to list as many USB-connected devices as possible.	Research the speed differences between USB 2.0, USB 3.0, and USB-C.	CO3
25	Connectors & Color Codes	Learn to identify common I/O ports by their shape and standard color codes.	A "port identification race" using the back of a PC or a diagram.	Take a picture or draw the back of a computer at home and label all the ports.	CO3
26	Hands-on Lab (Part 1)	Physically identify major components on a real motherboard.	Students use a checklist to find and identify components on provided motherboards.	Write down three components you found difficult to identify and why.	CO3
27	Hands-on Lab (Part 2)	Reinforce component identification skills and answer questions.	Continue with the motherboard identification lab, followed by a group Q&A.	Review all motherboard components in preparation for the unit test.	CO3
28	Unit 3 Review & Practical Test	Demonstrate the ability to correctly identify motherboard components and explain their functions.	A practical "spotting" test where students must label components on a motherboard.	Read the first chapter of the next unit on Memory.	CO3
Unit 4: Memory and I/O Devices (12 Classes)					
29	Memory Fundamentals	Differentiate between primary (RAM) and secondary (Storage) memory.	Use the analogy of a "workbench" (RAM) and a "filing cabinet" (HDD) to explain the difference.	Define "Volatile" and "Non-Volatile" memory and give an example of each.	CO4

30	Hard Disk Drive (HDD)	Explain the construction, components, and working principles of a mechanical hard drive.	Show a disassembled hard drive to display the platters and read/write head.	Research and list two advantages and two disadvantages of HDDs compared to SSDs.	CO4
31	File Systems	Introduce different file systems (FAT32, NTFS, exFAT) and their characteristics.	Discuss which file system is best for different scenarios.	Find out what file system your computer's main drive uses.	CO4
32	Disk Management	Understand the concepts of formatting and partitioning a hard drive.	Whiteboard demonstration of how a single physical drive can be split into multiple logical partitions.	Write a short paragraph explaining why you might want to partition a hard drive.	CO4
33	Practical Lab	Gain hands-on experience with disk management tools.	Students use Disk Management in Windows to create and delete a partition.	List the steps required to format a USB drive in Windows.	CO4
34	Removable Storage	Discuss the working principles of CDs, DVDs, and external hard drives.	Compare the storage capacities of a CD, a DVD, and a Blu-ray disc.	Research the difference between a DVD-R and a DVD-RW.	CO4
35	Solid State & Flash Drives	Explain the working principles of SSDs and USB flash drives.	Watch a short video explaining how flash memory works without moving parts.	List three reasons why SSDs are faster than traditional HDDs.	CO4
36	Keyboards	Understand keyboard interfacing, types of keys, and the concept of a keyboard matrix.	Compare a mechanical keyboard with a membrane keyboard.	Research and define "key rollover" and "anti-ghosting" in the context of gaming keyboards.	CO4
37	Mice	Discuss different types of mice (optical, laser) and their interfacing.	Group discussion on mouse ergonomics and features.	Find out the DPI of your mouse and what DPI stands for.	CO4
38	Printers	Explain the basic operation of inkjet and laser printers.	Use diagrams to show the step-by-step process of how a laser printer creates an image.	Compare the cost per page of a typical inkjet printer versus a laser printer.	CO4
39	Printer Troubleshooting	Identify and solve common printer issues.	Role-play troubleshooting scenarios.	Look up the steps to clean the print heads on an inkjet printer.	CO4
40	Scanners	Discuss types of scanners (flatbed, document feeder) and their operation.	Live demonstration of scanning a document and a photograph.	Explain the difference between a standalone scanner and an all-in-one printer/scanner.	CO4
Unit 5: Display, Power Supply, and BIOS (5 Classes)					

41	Display Technologies	Compare and contrast LCD, LED, and TFT displays and understand the role of a graphics card.	Look at the specifications for different monitors, comparing resolution, refresh rate, and panel type.	Define "resolution" and "refresh rate" in the context of a computer monitor.	CO5
42	Power Supply (SMPS)	Explain the basic principles of a Switched-Mode Power Supply and identify its different output voltages.	Using a multimeter, demonstrate how to check the output voltages on an SMPS.	Research what the different colored wires from a power supply signify.	CO5
43	BIOS Fundamentals	Discuss the core functions of BIOS and the difference between legacy BIOS and modern UEFI.	Whiteboard session to list all the tasks the BIOS performs from the moment you press the power button.	Write a short paragraph explaining one advantage of UEFI over traditional BIOS.	CO5
44	BIOS Setup	Learn how to access and navigate the BIOS/UEFI setup menu.	Live demonstration on a lab PC: boot into BIOS, explain key settings.	Research how to access the BIOS on two different computer brands (e.g., Dell and HP).	CO5
45	POST	Explain the Power-On Self-Test process and how to interpret common beep codes.	Play audio clips of different beep codes and have students look up their meaning on a chart.	Find and write down the meaning of a "single short beep" during POST.	CO5
Unit 6: Maintenance and Trouble Shooting (10 Classes)					
46	PC Assembly (Part 1)	Learn the initial steps of PC assembly, including safety and installing the CPU/RAM.	Hands-on practice: students practice opening and closing the CPU socket latch and installing RAM sticks.	Watch a video guide on installing a CPU and heatsink.	CO6
47	PC Assembly (Part 2)	Learn how to install the motherboard into the case and connect the power supply.	Demonstration of how to correctly install motherboard standoffs and connect the main power connectors.	Draw a diagram of the motherboard I/O panel and label at least five ports.	CO6
48	PC Assembly (Part 3)	Learn to install drives, expansion cards, and manage cables.	Hands-on lab: students practice installing a hard drive and connecting the front panel connectors.	Research and list three tips for good cable management inside a PC case.	CO6
49	Laptop Overview	Identify major laptop components and learn how to configure power settings.	Carefully open the back of a laptop to show the battery, RAM, and storage drive.	Compare the process of upgrading RAM in a desktop vs. a laptop.	CO6
50	OS Installation	Understand the process of formatting, partitioning, and installing an operating system.	Step-by-step walkthrough of the Windows installation process using a projector.	List the things you should do to prepare for a new OS installation.	CO6

51	Practical Lab	Gain hands-on experience installing an OS.	In pairs, students will install an OS on a virtual machine.	After installing the OS, list the first three drivers you would install on a new system.	CO6
52	Troubleshooting Methods	Learn systematic approaches to diagnosing computer problems.	Introduce a troubleshooting flow chart and work through a sample problem as a class.	Write down a time you fixed a tech problem and the steps you took.	CO6
53	Common Problems	Learn to diagnose and troubleshoot common hardware and software issues.	Brainstorm solutions for common problems.	Research what the "Blue Screen of Death" is and list two common causes.	CO6
54	Maintenance & Diagnostics	Understand the importance of preventive maintenance and learn about diagnostic tools.	Demonstrate how to use built-in tools like Windows Memory Diagnostic and Check Disk.	Create a weekly and monthly preventive maintenance checklist for a PC.	CO6
55	Virus & Antivirus	Understand what computer viruses are and the role of antivirus software.	Discuss different types of malware.	Compare the features of two popular free antivirus programs.	CO6
Unit 7: Networking Devices and Their Interfaces (5 Classes)					
56	Network Interface Card (NIC)	Explain the function of a NIC and identify different types (Ethernet, Wi-Fi).	Show physical examples of a PCI-e NIC and a USB Wi-Fi adapter.	Find the MAC address of your computer or phone and explain its use.	C07
57	Interconnecting Devices	Differentiate between a hub, switch, and router.	Draw diagrams showing how data flows through a hub versus a switch.	Explain in one sentence the main function of a router in a home network.	CO7
58	Network Cables	Discuss types of network cables (UTP, STP) and their categories.	Pass around samples of Cat5e and Cat6 cables, pointing out physical differences.	Research the maximum speed and distance for a Cat6 Ethernet cable.	CO7
59	Network Connectors	Learn to identify an RJ45 connector and understand the basics of creating a network cable.	Live demonstration of crimping an RJ45 connector onto a UTP cable.	Look up the T568B wiring standard and draw the color code order.	CO7
60	Final Review & Exam Prep	Consolidate knowledge from the entire course in preparation for the final exam.	Rapid-fire Q&A session covering all seven units.	Complete a practice final exam.	CO7

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11-07-2025
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