MODULE FOR SUMMER INTERNSHIP PROGRAMME 2025

(BY **MANTRA ASSOCIATES & E&ICT ACADEMY IIT GUWAHATI**)
on
HARDWARE & NETWORKING

OBJECTIVE:

1. Understand the fundamentals of PC hardware components and their functions.
2. Gain practical skills in assembling and maintaining personal computers (PCs).
3. Learn the installation and configuration of operating systems (Windows and Linux).
4. Master basic networking concepts and client-end device configuration.
5. Gain proficiency in using networking commands on both Windows and Linux systems.
6. Understand how to implement basic security settings and backup tasks on PCs.

OUTCOME:

1. Be able to assemble and troubleshoot computer hardware.
2. Successfully install and configure Windows and Linux operating systems.
3. Apply basic networking principles and configure client devices.
4. Set up IP configurations, firewalls, and manage network connections on end devices.
5. Efficiently use basic networking commands for troubleshooting on both Windows and Linux.
6. Perform routine maintenance tasks including backups, security settings, and software installations.

DURATION: ONE MONTH **(120 HOURS)**

PREREQUISITES:

1. Basic knowledge of computer components and their functions.
2. Familiarity with the basic use of operating systems (Windows or Linux).

INTERNSHIP STRUCTURE BREAKDOWN

DAY NO. & DATE	TOPICS TO BE COVERED	TIME DURATION
DAY 1 (TUESDAY) 01-07-2025	Introduction to PC components, Assembling a Desktop PC, Identifying motherboard components	2.5 HRS
DAY 2 (WEDNESDAY) 02-07-2025	Installing the motherboard and CPU, Attaching storage devices (HDD/SSD), Configuring the power supply	2.5 HRS
DAY 3 (THURSDAY) 03-07-2025	Assembling peripherals (keyboard, mouse, monitor), Installing and configuring the BIOS, Overclocking basics	2.5 HRS

DAY 4 **(FRIDAY)** 04-07-2025	Installing Windows OS (part 1), Partitioning the drive, System file setup, Disk management in Windows	3.5 HRS **(MCQ TEST 1)**
DAY 5 **(SATURDAY)** 05-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 6 **(SUNDAY)** 06-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 7 (MONDAY) 07-07-2025	Installing Windows OS (part 2), Completing setup and configuring user accounts, Managing startup programs	2.5 HRS
DAY 8 (TUESDAY) 08-07-2025	Installing device drivers on Windows, Troubleshooting common installation issues, Using Device Manager for hardware management	2.5 HRS
DAY 9 (WEDNESDAY) 09-07-2025	Introduction to Linux OS (Ubuntu), Installing Linux (part 1), Partitioning and boot loader configuration	2.5 HRS
DAY 10 (THURSDAY) 10-07-2025	Installing Linux OS (part 2), Configuring user permissions and partitions, Understanding Linux filesystem hierarchy	2.5 HRS
DAY 11 **(FRIDAY)** 11-07-2025	Installing device drivers on Linux, Configuring peripherals in Linux, Managing kernel modules in Linux	3.5 HRS **(MCQ TEST 2)**
DAY 12 **(SATURDAY)** 12-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 13 **(SUNDAY)** 13-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 14 (MONDAY) 14-07-2025	Introduction to networking basics (IP, Subnet, Gateway, DNS), Types of networks (LAN, WAN), Understanding OSI Model	2.5 HRS
DAY 15 (TUESDAY) 15-07-2025	Networking hardware (router, switches, NICs), Overview of IP addressing and subnetting, Configuring network interfaces on Linux	2.5 HRS
DAY 16 (WEDNESDAY) 16-07-2025	Basic networking commands (Windows: ipconfig, ping, tracert), Basic networking commands (Linux: ifconfig, ping, netstat), Using traceroute for network troubleshooting	2.5 HRS
DAY 17 (THURSDAY) 17-07-2025	Configuring static IP addresses on Windows, Configuring static IP addresses on Linux, Introduction to DHCP and Dynamic IP addressing	2.5 HRS
DAY 18 **(FRIDAY)** 18-07-2025	Introduction to firewalls and security basics on Windows, Configuring firewall settings on Windows, Using Windows Security for advanced configurations	3.5 HRS **(MCQ TEST 3)**

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DAY 19 **(SATURDAY)** 19-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 20 **(SUNDAY)** 20-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 21 (MONDAY) 21-07-2025	Introduction to firewalls and security basics on Linux, Configuring firewall settings on Linux, Using iptables for advanced Linux firewall configurations	2.5 HRS
DAY 22 (TUESDAY) 22-07-2025	Setting up backup solutions on Windows, File History and backup utilities on Windows, Using Windows PowerShell for backup automation	2.5 HRS
DAY 23 (WEDNESDAY) 23-07-2025	Setting up backup solutions on Linux, Using rsync for backups on Linux, Automating backups with cron jobs on Linux	2.5 HRS
DAY 24 (THURSDAY) 24-07-2025	Troubleshooting basic hardware issues on Windows (blue screen, device not detected), Troubleshooting hardware on Linux (dmesg logs, lspci)	2.5 HRS
DAY 25 **(FRIDAY)** 25-07-2025	Monitoring system performance on Windows (Task Manager), Monitoring system performance on Linux (top, htop), Understanding resource allocation in virtualized environments	3.5 HRS **(MCQ TEST4)**
DAY 26 **(SATURDAY)** 26-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 27 **(SUNDAY)** 27-07-2025	PROJECT WORK (9:30 AM to 5:00 PM)	7.5 HRS (ONLINE)
DAY 28 (MONDAY) 28-07-2025	Configuring shared folders and network drives on Windows, Configuring shared folders and network drives on Linux, Setting up Samba for cross-platform file sharing	2.5 HRS
DAY 29 (TUESDAY) 29-07-2025	Installing and configuring antivirus software on Windows, Securing Linux from viruses and malware, Understanding SELinux for Linux security	2.5 HRS
DAY 30 (WEDNESDAY) 30-07-2025	Final project: Setting up a complete system with Windows and Linux dual boot, Project demonstration and troubleshooting, Performing system diagnostics using hardware tools and software utilities	2.5 HRS
DAY 31 (THURSDAY) 31-07-2025	DOUBT CLEARING SESSION	**1 HR & VALEDICTORY SESSION**

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PROJECTS TO BE ASSIGNED TO THE INTERNS (MIN. 10):

1. Assembling a desktop PC from scratch.
2. Installing Windows OS and configuring user accounts.
3. Installing Linux OS (Ubuntu) and setting up user permissions.
4. Performing a Windows OS repair installation.
5. Setting up a dual-boot system with Windows and Linux.
6. Configuring system drivers for peripherals (keyboard, mouse, printer).
7. Basic PC troubleshooting: Diagnosing hardware failures.
8. Configuring a local area network (LAN) on Windows.
9. Configuring network interfaces in Linux (static and dynamic IP)
10. Implementing firewall rules on Windows OS.
11. Configuring network printer access on both Windows and Linux.
12. Setting up backup solutions in Windows and Linux.
13. Installing and configuring antivirus software on Windows.
14. Monitoring system performance using Windows Task Manager and Linux top/htop.
15. Configuring shared folders and network drives in Windows.

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