

Basic Computer Workshop Curriculum for CSE Students

This workshop curriculum provides a foundational introduction to essential computing concepts for first-year Computer Science and Engineering (CSE) students. Designed to offer comprehensive, hands-on experience, the program covers core computer functions, operating systems, hardware basics, and fundamental troubleshooting skills. Students will gain the confidence to navigate Windows environments and utilize terminal commands effectively.

by,

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Program Overview and Learning Goals

This workshop is designed to equip students with the fundamental knowledge and practical skills necessary to confidently interact with computer systems. The curriculum covers essential topics ranging from file management and operating system navigation to hardware basics and software troubleshooting.



Core Computer Functions

- Effective file and directory management
- Understanding operating system roles
- Basic hardware component identification



Software & System Proficiency

- Proper software installation procedures
- Fundamental troubleshooting techniques
- Introduction to terminal usage (Windows & Bash)



Confident Navigation

- Navigating Windows environments proficiently
- Using the Bash terminal on Windows (WSL/Git Bash)
- Performing basic system configuration tasks

Week 1: Computer Architecture and Operating Systems

Session 1: Introduction to Computer Architecture

This session provides a fundamental understanding of how computers are built and how their internal components interact. Students will learn about the core elements that make up a computer system and the flow of data within it.

- **Basic Components:** CPU, RAM, Storage (HDD/SSD), Motherboard
- **Data Flow:** How data is transferred and processed
- **32-bit vs. 64-bit Architecture:** Understanding the differences, memory addressability, and impact on performance and compatibility. Students will learn why 64-bit systems are now standard.



Session 2: Understanding Operating Systems

This session offers an overview of operating systems (OS) and their critical role in managing computer hardware and software resources. The focus will be on the Windows operating system, given its prevalence.

- Overview of Windows operating systems and their evolution
- Key features and functionalities of Windows
- Common OS tools and utilities like Task Manager for process monitoring and System Monitor for performance analysis.

Week 2: File Management, Software & Security

Session 3: File System and Directory Structure

Learn how files are organized and managed in Windows. Topics include the standard directory structure (e.g., C:\, Program Files), basic file operations like copying, moving, and deleting, and understanding file extensions and permissions.

Session 4: Software Installation and Path Configuration

This session covers the process of installing software in Windows using common installer types like .exe. Students will also learn how to modify the PATH environment variable for global access to installed applications, a crucial skill for developers.

Session 5: Drivers and Their Importance

Explore the essential role of device drivers, which enable the operating system to communicate with hardware components. This session will cover installing, updating, and managing drivers using Windows Device Manager, ensuring optimal hardware performance.

Session 6: Antivirus and Basic System Security

Understand the importance of antivirus software and fundamental computer security practices. Topics include an overview of tools like Windows Defender, performing system scans, and strategies to avoid malware and suspicious downloads to protect your system.

Week 3: Troubleshooting and Terminal Commands

Session 7: Basic Troubleshooting and System Maintenance

This session focuses on equipping students with practical skills to diagnose and resolve common computer issues. It covers systematic troubleshooting techniques for both software and hardware problems.

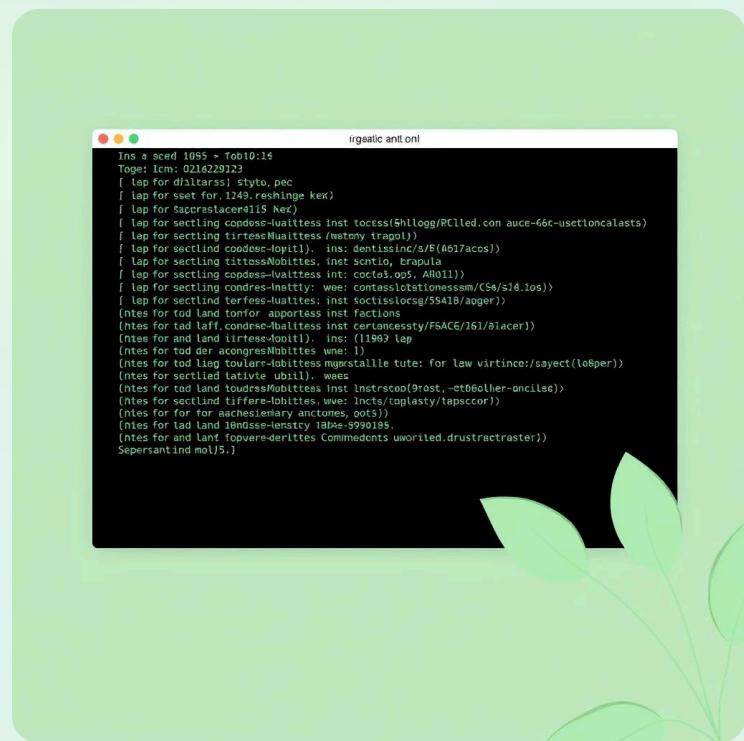
- **Performance Checks:** Utilizing Task Manager to identify and address resource-intensive processes.
 - **Common Issues:** Strategies for solving internet connection problems, system freezes, and application crashes.
 - **Troubleshooting Commands:** Introduction to basic network diagnostics with ping, tracert, and netstat.



Session 8: Introduction to the Bash Terminal

This session introduces students to the command-line interface, a powerful tool for system interaction and automation. It highlights the distinction between Windows Command Prompt and the Bash terminal.

- **What is Bash?** Understanding its role as a command language and shell.
 - **Installation:** Guidance on setting up Bash using Windows Subsystem for Linux (WSL) or Git Bash.
 - **Basic Bash Commands:** Hands-on practice with fundamental commands such as `cd` (change directory), `ls` (list contents), `mkdir` (make directory), `rm` (remove), `cp` (copy), and `mv` (move).



Mastering Terminal Commands

This session delves deeper into practical terminal usage, providing hands-on experience with essential commands for both Windows Command Prompt and the Bash terminal. Proficiency in these commands is vital for efficient system management and scripting.



Windows Command Prompt

- `cd`: Navigate directories
- `dir`: List directory contents
- `cls`: Clear the screen
- `echo`: Display messages
- `del`: Delete files

Bash Terminal

- `cd`: Navigate directories
- `ls`: List directory contents
- `echo`: Display messages
- `rm`: Remove files/directories
- `cp`: Copy files/directories
- `mv`: Move files/directories

Understanding the nuances and common applications of these commands will significantly enhance a student's ability to automate tasks, manage files, and troubleshoot more effectively.

Review and Q&A Session

The final session is dedicated to reinforcing the concepts covered throughout the workshop and addressing any lingering questions. This interactive session ensures that students have a solid grasp of the foundational computing skills.



Comprehensive Recap

A quick review of all core topics covered:

- File management techniques and best practices
- Software installation and uninstallation procedures
- The importance and management of drivers
- Antivirus software and basic cybersecurity principles
- Practical usage of both Windows and Bash terminals



Open Q&A Discussion

An opportunity for students to ask questions, clarify doubts, and discuss specific challenges they encountered during the hands-on exercises. This fosters a deeper understanding and addresses individual learning needs.



Future Learning Paths

Guidance on resources and next steps for continued learning in computer science, including recommendations for advanced topics and practical projects to build upon the workshop's foundation.