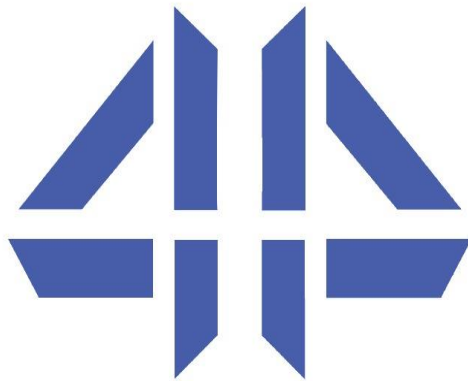


4P Advisory Services

V1.0

Training Program on

**Computer Architecture, Operating
System, Computer Network and Security**



4P Advisory Services

www.4pa.in

Computer Architecture, Operating System, Computer Network and Security

A. Computer Architecture

What is a Computer Architecture?

Computer Architecture refers to the design of the internal hardware components of a computer system, including the processor, memory, input/output devices, and storage devices. It includes topics such as instruction set architecture, microarchitecture, cache memory, virtual memory, and performance optimization.

Why a better Computer Architecture?

Advantages of Computer Architecture: Improved performance: Computer Architecture design plays a significant role in improving the performance of computer systems by optimizing hardware components such as the processor, memory, and storage devices. Reduced cost: Efficient design of computer architecture can lead to a reduction in the overall cost of the computer system. A good architecture can also aid, in providing Scalability, Security, Application Support and Reliability

Why learn about Computer Architecture?

- Improved problem-solving skills: Computer architecture involves understanding the organization and design of computer systems, which can help improve problem-solving skills by providing a deeper understanding of how different parts of a computer system work together.
- Enhanced computer performance: By understanding computer architecture, you can optimize hardware and software to improve computer performance.
- Better understanding of programming: Knowledge of computer architecture can help you understand how programming languages are executed by the computer, which can help you write more efficient and effective code.
- More opportunities to work on modern technologies: Computer architecture is a fundamental skill required for many modern jobs in the technology industry, so learning it can help you qualify for a wider range of working opportunities in various departments.

Learning Objectives of Computer Architecture topic:

- Understanding the basics of computer architecture, including the CPU, memory, and storage devices.
- Understanding how the CPU executes instructions and how memory and storage are used in the process.
- Understanding the tradeoffs between different computer architectures and the factors that affect performance.

B. Operating Systems

What are Operating Systems?

Operating System (OS) is software that manages computer hardware and software resources and provides common services for computer programs. It includes functions such as memory, process, file, and device management. Examples of popular operating systems are Windows, macOS, Linux, and Android.

Why Operating Systems?

- **Resource management:** The OS manages computer hardware resources such as the CPU, memory, disk space, and input/output devices. This ensures that different applications running on the system do not interfere with each other.
- **Device support:** The OS provides drivers for different hardware devices such as printers, scanners, and cameras. This enables these devices to be used with the computer.

Overall, an operating system provides a layer of abstraction between the hardware and software, which simplifies the development and management of computer systems.

Why learn about Operating Systems?

- **Better Understanding of Computer Functionality:** Learning to understand how computer hardware and software work together to perform tasks.
- **Increased Job Opportunities:** Operating system expertise is highly valued in the technology industry, and individuals with strong operating system knowledge may have more job opportunities available to them.
- **Ability to Troubleshoot Issues:** With knowledge of operating systems, individuals can more effectively troubleshoot and resolve computer issues, saving time and money on technical support.

Learning Objectives of Operating System topic:

- Understanding the purpose and function of operating systems.
- Understanding the various types of operating systems, including desktop, server, and mobile operating systems.
- Understanding how operating systems manage resources such as memory, CPU time, and input/output devices.
- Understanding how to navigate and manage operating systems.

C. Computer Networks and Security

What are Computer Networks and Security ?

Computer Network and Security refer to designing, implementing, and maintaining computer networks and security measures to protect the networks from unauthorized access, data theft, and other cyber-attacks. It includes topics such as network protocols, network services, network topology, cybersecurity, cryptography, and network security policies and procedures.

Why Computer Networks and Security?

- **Advantages of Computer Network and Security:** Improved communication: Computer networks allow users to communicate and share resources easily, leading to increased collaboration and productivity. Remote access: Computer networks enable remote access to resources and data, which can improve efficiency and reduce the need for physical presence in a particular location.
- **Protect Data and Resources:** Computer network and security measures protect data and resources from unauthorized access and cyber-attacks, reducing the risk of data theft and system downtime.

Why learn about Computer Network and Security?

- **Better understanding of how networks function:** Learning how data travels across networks, how different devices connect and communicate with each other, and how protocols and services operate.
- **Improved ability to troubleshoot network issues:** Identify and resolve network-related issues, including connectivity problems, configuration errors, and security vulnerabilities.
- **Better ability to manage network resources:** Manage network resources effectively, including bandwidth, storage, and network devices. This can lead to better network performance and reduced downtime.

Learning Objectives of Computer Network and Security topic:

- Understanding the basics of computer networks, including network architecture, protocols, and services.
- Understanding the common network topologies and their advantages and disadvantages.
- Understanding the options to protect data and communication.
- Understanding how to security policies and procedures.

Audience

The audience for this training program would typically be individuals who are interested in or working in information technology. This may include IT professionals, system administrators, network engineers, or software developers. ***It is also for the students who are likely to join large organizations in entry-level positions.***

Candidate Prerequisites

- College Graduate
- Candidates should have a basic understanding of how to use a computer.
- A basic understanding of programming concepts
- Familiarity with computer hardware and software

Lab requirements for the classroom:

(Note: The requirements are tentative and may change based on the final content)

Software:

- Operating systems: Windows with admin access

Hardware:

- Laptop / Desktop with at least an i5 processor, 8GB RAM, and a Hard drive, with Wi-Fi and Network Interfaces
- Two Wireless Router with RJ45 connectivity

Training Outline:

Note: These sessions are designed for beginners who have just graduated from engineering colleges and are joining a corporation. The practical activities are designed to be simple and easy to follow and do not require any advanced technical skills.

Day 1**Session 1: Introduction to Computers**

- *Overview of computer hardware and components*
- *Operating system fundamentals*
- *File systems and storage devices*
- *Hands-on activity: Installing and configuring Windows operating system*

Session 2: Introduction to Computer Networks

- *Overview of computer networks*
- *Network topologies and models*
- *Network protocols and devices*
- *Hands-on activity: Setting up a basic computer network*

Session 3: Introduction to Information Security

- *Overview of information security concepts*
- *Threats and vulnerabilities*
- *Confidentiality, integrity, and availability (CIA) triad*
- *Hands-on activity: Developing a strong password using a password generator tool*

Day 2**Session 4: Introduction to Operating Systems**

- *Operating system structure and components*
- *User accounts and file permissions*
- *System performance monitoring*
- *Hands-on activity: Creating and managing user accounts in Windows*

Session 5: Introduction to Computer Security

- *Types of computer security threats*
- *Basic security measures and controls*
- *Security policies and procedures*
- *Hands-on activity: Implementing basic security measures on a Windows operating system*

Day 3

Session 6: Introduction to Security Management

- *Security management and governance*
- *Risk management and assessment*
- *Compliance and regulatory requirements*
- *Hands-on activity: Developing a basic security plan*

Session 7: Introduction to Incident Response and Disaster Recovery

- *Incident response planning and procedures*
- *Disaster recovery planning and procedures*
- *Business continuity planning*
- *Hands-on activity: Developing a basic incident response plan*

Session 8: Introduction to Network Security

- *Overview of network security*
- *Firewalls and intrusion detection systems (IDS)*
- *Virtual private networks (VPN)*
- *Hands-on activity: Configuring a basic firewall on a network*