Computers and Information Technology · IT260

Operating Systems Engineering

A Comprehensive Exploration of Operating System Design, Architecture, and Management

Duration	Category	Ref
1 Week	**Computers and Information Technology**	**IT260**
Language	Certificate	
English	**Certificate of attendance**	

Introduction

Welcome to the "Operating Systems Engineering" course, a meticulously designed training programme aimed at providing participants with a deep understanding of operating systems (OS). Operating systems form the backbone of any computing environment, managing hardware resources and providing the necessary services for application software. This course is structured to offer a detailed examination of OS principles, architecture, and hands-on management practices.

Over the next five days, you will delve into the fundamental concepts of operating systems, exploring various types such as Windows, Linux, and Unix. The course will guide you through the intricacies of OS architecture, process management, memory management, file systems, and security. Additionally, you will gain practical skills in configuring and troubleshooting operating systems in real-world scenarios.

This course blends theoretical knowledge with hands-on experience, ensuring that you not only understand the concepts but can also apply them effectively. By the end of this course, you will have a comprehensive understanding of operating systems engineering, preparing you for advanced roles in system administration and engineering.

Course Objectives of Operating Systems Engineering

Upon completing this programme, participants will be able to:

- Understand the fundamental concepts and architecture of operating systems.
- Manage and optimise processes, memory, and storage in various operating systems.
- Implement security measures to protect operating systems from threats.
- Troubleshoot common OS issues and perform system maintenance tasks.
- Apply best practices in configuring and managing operating systems.

Course Methodology of Operating Systems Engineering

- Lectures and Expert Insights: Leading industry experts will share their insights and best practices.

- Case Studies: Analyse real-world talent acquisition challenges and solutions.
- Group Discussions: Engage in meaningful discussions and share experiences with peers.
- Role-Playing and Simulations: Practice recruitment scenarios to enhance skills.
- Hands-on Workshops: Gain practical experience in using recruitment tools and techniques.

Organisational Impact of Operating Systems Engineering

This training programme will have a positive impact on organisations by:

- Enhanced Efficiency: Staff will be equipped with the knowledge to optimise and manage OS environments, leading to improved system performance and productivity.
- Cost Savings: By understanding OS management, employees can prevent downtime and reduce the need for external support.
- Security Improvements: Knowledge of OS security principles will help in protecting organisational data and reducing the risk of cyber threats.
- Scalability: Employees will be capable of scaling and managing OS environments to meet organisational demands.
- Innovation: Empowered with in-depth OS knowledge, employees can drive innovation and improve IT infrastructure management.

Personal Impact of Operating Systems Engineering

Participants will experience personal growth and development, including:

- Skill Enhancement: Participants will gain valuable technical skills in operating system management applicable to various IT roles.
- Career Advancement: Knowledge of OS engineering can open doors to advanced certifications and career opportunities in system administration and engineering.
- Confidence Building: Hands-on practice and theoretical understanding will boost participants' confidence in managing OS environments.
- Problem-Solving: Improved problem-solving skills related to OS configuration and troubleshooting will be developed.
- Professional Growth: Continuous learning and development in OS principles will contribute to overall professional growth and adaptability.

Who Should Attend

This training programme is ideal for:

- IT Professionals: Those new to OS management or seeking to solidify their foundational knowledge.
- System Administrators: Individuals looking to broaden their expertise in managing different operating systems.
- Network Engineers: Professionals responsible for integrating and managing OS within network environments.
- Developers: Software developers wanting to understand the underlying OS principles to optimise application performance.

Course Outlines

Day 1

Introduction to Operating Systems

- Welcome and course overview
- Introduction to operating systems: Definitions and key concepts
- History and evolution of operating systems
- Types of operating systems: Windows, Linux, Unix, and macOS
- OS architecture: Kernel, shell, and system calls
- Basic functions of an operating system

Day 2

Process Management

- Understanding processes and threads
- Process scheduling algorithms: Round-robin, FIFO, priority scheduling
- Inter-process communication (IPC) mechanisms
- Concurrency and synchronisation: Mutexes, semaphores, and monitors
- Deadlocks: Causes, detection, and prevention

Day 3

Memory Management

- Introduction to memory management: RAM and virtual memory
- Paging and segmentation
- Memory allocation strategies: Fixed and dynamic partitioning
- Swapping and paging mechanisms
- Memory management in modern OS: Linux and Windows

Day 4

File Systems and Storage Management

- File system architecture: Directories, inodes, and superblocks
- Types of file systems: NTFS, FAT, ext4, HFS+
- File system management: Mounting, formatting, and checking
- Storage management: RAID configurations and disk partitioning
- File system security: Permissions and encryption

Day 5

Security and Troubleshooting

- Operating system security fundamentals
- User authentication and access control mechanisms
- Common OS vulnerabilities and mitigation techniques
- Troubleshooting OS issues: Tools and best practices
- Performance monitoring and optimisation
- Course review and Q&A

Ask us for a date for this course
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