



Data Center Implementation with Hyperscale and Modern Technology

Duration: 4 hrs

Module 1: Introduction to Data Centers

- 1.1 Overview of Data Centers
- 1.2 Evolution of Data Centers
- 1.3 Types of Data Centers
 - Enterprise Data Centers
 - Managed Services Data Centers
 - Colocation Data Centers
 - Hyperscale Data Centers

Module 2: Data Center Architecture

- 2.1 Data Center Components
 - Compute
 - Storage
 - Networking
 - Data Center Infrastructure
 - Power and Cooling Systems
 - Physical Security
 - Network Infrastructure
 - Data Center Topologies
 - Traditional Three-Tier Architecture
 - Spine-Leaf Architecture

Module 3: Hyperscale Data Centers

- Definition and Characteristics
- Key Providers (e.g., AWS, Google, Microsoft)
- Design Principles
- Benefits and Challenges
- Case Studies

Module 4: Cloud Computing and Data Centers

- 4.1 Overview of Cloud Computing
- 4.2 Public Cloud /Private Cloud /Hybrid Cloud
 - Key Providers
 - Services and Offerings
 - Use Cases
 - Definition and Deployment Models
 - Key Technologies (e.g., VMware, OpenStack)
 - Integration of Public and Private Clouds
 - Use Cases and Benefits

Module 5: Modern Data Center Technologies

- 5.1 Virtualization
 - Server Virtualization
 - Network Virtualization
 - Storage Virtualization

- Software-Defined Data Centers (SDDC)
- Definition and Components
- Key Technologies (e.g., VMware NSX, Software-Defined Storage)
- Containers and Microservices
- Containerization (e.g., Docker, Kubernetes)
- Microservices Architecture
- Hyperconverged Infrastructure (HCI)
- Definition and Benefits
- Leading Solutions (e.g., Nutanix, VMware vSAN)

Module 6: Data Center Operations and Management

6.1 Data Center Management Tools

- DCIM (Data Center Infrastructure Management)
- Monitoring and Automation Tools
- Security in Data Centers
- Physical Security Measures
- Cybersecurity Best Practices
- Energy Efficiency and Sustainability
- Green Data Centers
- Energy Management Techniques

Module 7: Industry Standards and Compliance

7.1 Data Center Standards

- Uptime Institute's Tier Standards
- ANSI/TIA-942 7.2 Cloud Security Standards
- ISO/IEC 27001
- SOC 2
- GDPR 7.3 Operational Standards
- ITIL
- COBIT

Module 8: Design and Planning of Data Centers

- Site Selection and Infrastructure Design
- Capacity Planning and Scalability
- Risk Assessment and Disaster Recovery Planning
- Cost Estimation and Budgeting

Module 9: Implementation and Deployment

9.1 Construction and Deployment Phases

- Site Preparation
- Equipment Installation
- Network Setup
- Integration with Existing Systems
- Testing and Validation
- Performance Testing
- Security Testing

Module 10: Case Studies and Real-World Examples

- Hyperscale Data Center Implementations
- Colocation Data Center Examples
- Cloud Data Center Integrations
- Innovations and Future Trends in Data Centers