
Add-On Course: Certificate in Edge Computing

Course Duration: 30 Hours

Syllabus

Module 1: Introduction to Edge Computing

Duration: 6 Hours

Objectives:

- Define edge computing and understand its importance.
- Identify the key components and benefits of edge computing.

Topics:

1. **Overview of Edge Computing** (2 Hours)
 - Definition and key concepts
 - History and evolution of edge computing
2. **Edge vs. Cloud Computing** (1.5 Hours)
 - Differences and similarities
 - When to use edge computing
3. **Key Components of Edge Computing** (2.5 Hours)
 - Edge devices and sensors
 - Edge gateways and nodes
 - Data processing at the edge

Module 2: Core Technologies and Architectures

Duration: 7 Hours

Objectives:

- Understand the fundamental technologies enabling edge computing.
- Explore common architectures and their use cases.

Topics:

1. **Technologies Supporting Edge Computing** (3 Hours)
 - IoT (Internet of Things)
 - 5G and network technologies
 - Edge AI and machine learning
2. **Architectural Models** (2.5 Hours)
 - Edge-centric architecture
 - Fog computing and mist computing
 - Hybrid edge-cloud models
3. **Key Use Cases and Applications** (1.5 Hours)
 - Smart cities
 - Healthcare
 - Manufacturing and industrial IoT

Module 3: Implementing Edge Computing Solutions

Duration: 8 Hours

Objectives:

- Gain practical experience in deploying and managing edge computing solutions.

- Learn about tools and platforms for edge computing.

Topics:

1. **Edge Computing Platforms (2 Hours)**
 - Overview of popular platforms (e.g., AWS IoT Greengrass, Azure IoT Edge)
 - Platform capabilities and features
 2. **Developing Edge Applications (3 Hours)**
 - Building simple edge applications
 - Using containers and lightweight runtimes
 3. **Deployment and Management (3 Hours)**
 - Provisioning and configuring edge devices
 - Monitoring and managing edge environments
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Module 4: Challenges and Future Trends

Duration: 6 Hours

Objectives:

- Identify and address challenges associated with edge computing.
- Explore future trends and developments in edge computing.

Topics:

1. **Challenges in Edge Computing (2 Hours)**
 - Security and privacy concerns
 - Data management and synchronization
 - Scalability and performance issues
 2. **Emerging Trends and Technologies (2 Hours)**
 - Edge computing in conjunction with 5G and AI
 - Advances in edge device capabilities
 3. **Future Directions and Innovations (2 Hours)**
 - Potential impact of edge computing on various industries
 - Innovations on the horizon
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Module 5: Review and Capstone Project

Duration: 3 Hours

Objectives:

- Consolidate knowledge and apply it in a practical scenario.
- Evaluate and present findings from a capstone project.

Topics:

1. **Course Review and Q&A (1 Hour)**
 - Recap of key concepts
 - Open floor for questions and discussion
 2. **Capstone Project Presentation (2 Hours)**
 - Presentation of group projects
 - Peer review and feedback
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Total Duration: 30 Hours