BLACKBIRD FOR TRAINING

5G Network Architecture and Edge Computing



5G Network Architecture and Edge Computing

Introduction

The fifth generation of mobile networks represents a transformational leap in the world of digital connectivity. 5G Network Architecture and Edge Computing together form the backbone of modern communication systems, offering unprecedented speed, ultra-low latency, and the capacity to connect billions of devices seamlessly.

This course provides a comprehensive understanding of 5G network architecture — its layers, components, and operational models — along with the role of edge computing in enhancing efficiency and reducing latency. Participants will explore how these technologies support intelligent systems, industrial automation, and next-generation digital applications across multiple industries.

The program combines theoretical insight with practical examples, empowering participants to design and manage robust, secure, and scalable 5G infrastructures.

Course Objectives

By the end of this course, participants will be able to:

- Understand the key components and architecture of 5G networks.
- Analyze the technological differences between previous generations and 5G.
- Recognize the role of edge computing in improving data processing and reducing latency.
- Design integrated solutions combining 5G and edge computing.
- Apply best practices in network planning, management, and optimization.
- Identify security and governance challenges in 5G deployment.
- Evaluate the impact of 5G on emerging technologies and business transformation.
- Develop strategic approaches to implement next-generation network infrastructures.

Course Outlines

Day 1: Introduction to 5G Networks

- Overview of mobile network evolution from 1G to 5G.
- Core concepts and guiding principles of fifth-generation networks.
- Understanding the 5G system architecture and its main elements.
- Comparison between 4G and 5G in terms of performance, latency, and scalability.
- Real-world applications of 5G in various industries.
- Practical session: designing a simple 5G network model.



Day 2: 5G Network Architecture and Core Technologies

- Detailed exploration of the 5G network structure and layers.
- Understanding radio access networks and core components.
- Concept of network slicing and its role in resource optimization.
- Data transport mechanisms and integration with virtualized systems.
- Overview of the service-based architecture used in 5G.
- Practical exercise: analyzing network topology and data flow efficiency.

Day 3: Edge Computing Fundamentals

- Definition and importance of edge computing in modern networks.
- Key differences between edge and cloud computing.
- Moving data processing closer to the user to reduce latency.
- Real-life applications of edge computing in smart cities and industry.
- Integrating edge systems with 5G infrastructure for better efficiency.
- Workshop: designing an edge network architecture for a specific business case.

Day 4: Security, Governance, and Performance Management

- Security challenges in open 5G and edge environments.
- Data protection, encryption, and authentication mechanisms.
- Establishing network governance and compliance standards.
- Monitoring and managing performance in large-scale networks.
- Case study: implementing secure and resilient 5G architecture in enterprises.
- Exercise: creating a risk management plan for 5G and edge networks.

Day 5: Future Applications and Final Evaluation

- The evolution of 5G towards future communication technologies.
- Interaction between 5G, artificial intelligence, and the Internet of Things.
- How edge computing supports automation and real-time analytics.
- Discussion of best practices for adopting advanced network infrastructures.
- Capstone project: developing a strategic roadmap for enterprise 5G adoption.
- Final assessment and summary of key learning points.



Why Attend this Course: Wins & Losses!

- Gain an in-depth understanding of 5G architecture and edge computing principles.
- Learn how to design and manage high-performance, next-generation networks.
- Enhance your ability to integrate 5G technologies into enterprise systems.
- Improve operational efficiency through edge-based data processing.
- Strengthen your organization's readiness for future digital transformation.
- Understand security, governance, and performance aspects of 5G networks.
- Apply practical tools to analyze, optimize, and monitor network operations.
- Build strategic thinking in planning scalable and reliable communication systems.

Conclusion

The 5G Network Architecture and Edge Computing course provides participants with a strategic and technical foundation to navigate the new era of hyper-connectivity.

By combining the power of high-speed communication with localized data processing, organizations can achieve faster, smarter, and more efficient operations across all sectors.

Through this course, participants will gain both theoretical and practical understanding of how to design and operate next-generation communication networks that drive innovation, efficiency, and digital transformation.

