

# Nokia Bell Labs End-to-End 5G Certification

NokiaEDU

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# Nokia Bell Labs E2E 5G Certification Program

## Overview

We are on the cusp of Industry 4.0

- Opportunity: capture the new value and revenue opportunity promised by 5G

Technology and business solutions are moving fast

- Look ahead, and plan from the future back

User demands are increasingly real-time

- End-to-end solutions need to enable this new reality
- Understanding of end-to-end solutions, and how they work, is needed

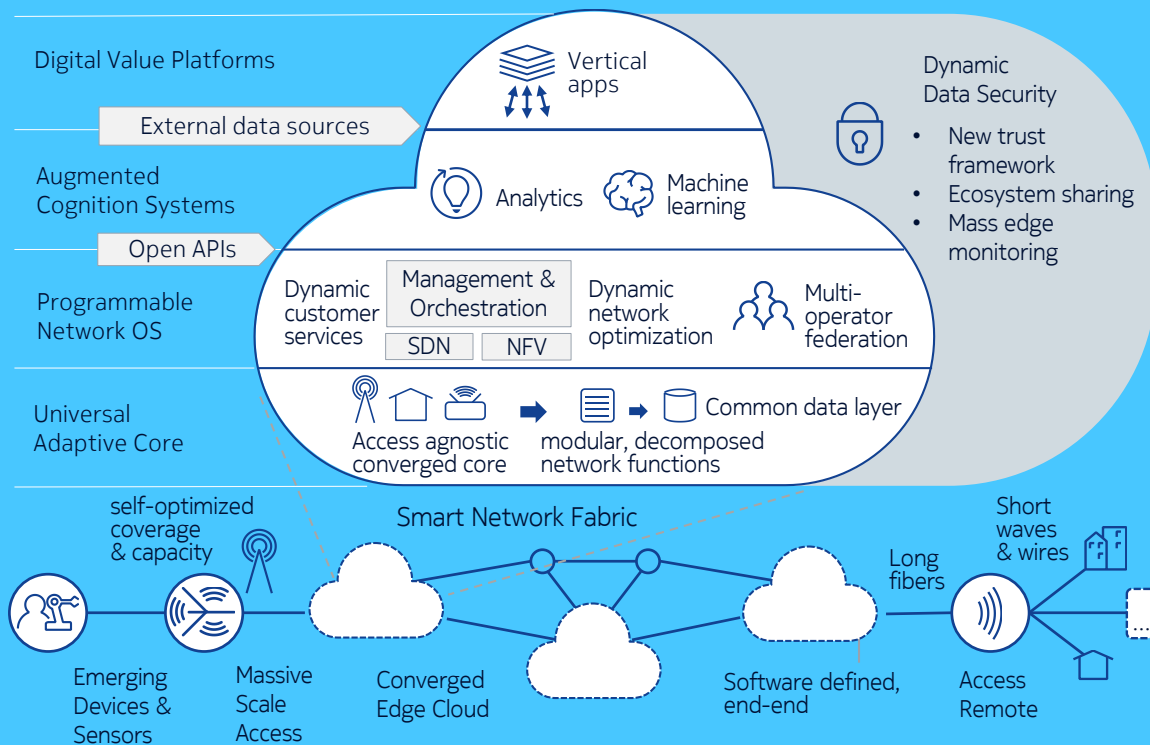
Bell Labs E2E 5G Certification: designed to address this industry knowledge need

Certification validates substance and rigor

- Generate real business value for industry players
- Add tangible value to an individual's career



# A blueprint to a deeply interconnected future



# How will this program help you?

The E2E 5G Certification program is designed to provide specific competencies for your current and future roles

## Individual learners

- Students
- Industry Job Seekers
- Business Professionals & Executives

## Industry players

Know-how to enhance business performance and employee development

## Service providers

Insights and knowledge of emerging end-to-end 5G solutions, for an edge in the market



# Program description

Certification Levels	Audience	Focus	Delivery	Certifications
<ul style="list-style-type: none"><li>• Associate</li><li>• Professional</li></ul>	<ul style="list-style-type: none"><li>• Independent, vendor-agnostic content – relevant for all</li><li>• Applied technology for new business value creation</li></ul>	<ul style="list-style-type: none"><li>• Strategy and planning</li><li>• End-to end network capabilities</li><li>• Connection to Future X</li></ul>	<ul style="list-style-type: none"><li>• Emphasis on self-paced training for maximum convenience</li><li>• Instructor-led sessions</li></ul>	<ul style="list-style-type: none"><li>• Awarded by passing knowledge-based exams</li><li>• Externally proctored</li></ul>

## **NOKIA** Bell Labs E2E 5G Certification Associate

Available now

The Associate level Certification provides a basic level understanding of the key business issues, fundamental principles and technical pillars of 5G.

It is ideal for learners needing to understand and apply foundational knowledge of E2E 5G.

## **NOKIA** Bell Labs E2E 5G Certification Professional

2020 rollout

The Professional level Certification covers 5 different domains: 5G Networking, Cloud, Slicing, Security & Industrial Automation.

Learners can earn their professional certifications in any or all of the domains.

[www.nokia.com/networks/training/5g/bell-labs/](http://www.nokia.com/networks/training/5g/bell-labs/)



# Nokia Bell Labs End-to-End 5G Certification Program

## Nokia Bell Labs End-to-End 5G Foundation Course

**NOKIA** Bell Labs  
E2E 5G Certification  
Associate



Nokia Bell Labs End-to-End 5G Associate Examination

## Individual End-to-End 5G Professional Courses

**NOKIA** Bell Labs  
E2E 5G Certification  
Professional



Individual 5G Professional Certification Examinations

# Foundation course overview

## Learning Objectives

- Apply your understanding of key business issues, fundamental principles and technical pillars of 5G needed to engage in and contribute to various 5G strategy and planning initiatives.
- Recognize the importance of a future-back approach.
- Better understand the technologies that enable and support 5G evolution.
- Apply your knowledge of end-to-end 5G for the purpose of strategy and planning, and the creation of new business value.
- Critically review the leading industry trends and use cases to be able to expand your capabilities to discuss them with ease

### Unit 1: The 5G Imperative

- 5G drivers and technology essentials
- The industry journey to end-to-end 5G

### Unit 2: Foundation of 5G Networking

- Access, Core, Transport:
- Requirements
  - Key technology enablers
  - New architecture

### Unit 3: Foundation of Distributed Cloud

- Requirements of 5G distributed cloud
- Key technology architecture and enablers
- Benefits of distributed cloud

### Unit 4: Foundation of Network Slicing

- Essential requirements and principals underlying network slicing
- Slicing architecture and enablers
- Benefits of slicing automation

### Unit 5: Foundation of Security

- 5G security requirements
- 5G security standards and enablers
- End-to-end 5G security architecture

### Unit 6: Foundation of Industrial Automation

- Requirements of Industry 4.0
- Lead-up to effective industrial automation
- 5G-enabled uses cases
- Value of use cases to various industries



# Appendix



# Learning Objectives

## UNIT 1

### 5G Drivers & Technology Essentials

- Discriminate among the limits in consumer value creation, current networks, and total cost of ownership (TCO) that are driving the need for an end-to-end approach in 5G.
- Explore the business trends and technology evolution that create the new opportunities associated with Industry 4.0
- Evaluate the importance of new automated solutions.

### Industry Journey to E2E 5G

- Ascertain which are the key industries that will capitalize on E2E 5G today and tomorrow.
- Explore how E2E 5G performance capabilities of extreme throughput, ultra low latency, improved reliability and massive connectivity are enabling new value creation for those industries.
- Consider the industry example that will be used for exercises throughout the course.

## UNIT 2

### Foundation of 5G Networking - Access

- Express how access is evolving in the 5G era to provide the capacity, latency, reliability and connectivity needed for emerging business applications.
- Evaluate 5G access in light of the continuing evolution of fiber, cable, copper and WiFi technologies.
- Articulate the fundamentals of the underlying technology and architecture of 5G access.

### Foundation of 5G Networking - Core

- Evaluate the limitation of core today, and how it must adapt for the evolution of 5G networks.
- Analyze the technology concepts that enable the core to be both universal and adaptive for E2E 5G.
- Examine the main functions a universal and adaptive core will deliver in an E2E 5G network.
- Depict how the universal adaptive core is evolving to address 5G enterprise, industrial and convergence needs.

### Foundation of 5G Networking - Transport

- Explain how the transport network will meet the scalability, reliability, flexibility and efficiency needs of 5G.
- Map the key transport technology enablers that will drive capacity, flexibility, optimization, traffic management and slicing SLAs in the 5G transport network.
- Describe the overall architecture of a 5G transport network.
- Understand how a flexible and scalable transport network enables the business potential of 5G.

# Learning Objectives

## UNIT 3

### Foundation of Distributed Cloud

- Describe how a distributed cloud is an essential element for E2E 5G delivery of low-latency services and applications.
- Understand the strategic benefit of distributed clouds in support of dense 5G RAN deployments, local low-latency services and network slicing.
- Map how edge clouds fit as part of a distributed-cloud environment, especially for industry players needing to enable low-latency, on-site services.
- Understand the relevant deployment options to consider in planning distributed cloud for 5G.
- Consider the strategic hardware and software technology decisions and investments needed to enable service delivery from distributed cloud.

## UNIT 4

### Foundation of Network Slicing

- Understand the origin and basic technical details of the concept of network slicing.
- Be familiar with the concept of 5G end-to-end QoS/SLA, and how slicing delivers these concepts in an end-to-end 5G network.
- Explain examples of technical and economic benefits from network slicing.
- Understand why network slicing requirements are a paramount driver of end-to-end 5G networks.

## UNIT 5

### Foundation of Security

- Identify the security requirements for 5G.
- Recognize the security measures needed in 5G.
- List example of potential attack vectors on a 5G networks.
- List the main 3GPP 5G security features.
- List the main cloud, NFV and network slicing security principles.
- Understand the need of integrated and automated AI/ML based security solution for holistic and efficient end-to-end 5G security.

## UNIT 6

### Foundation of Industrial Automation

- Describe how the intersection of operational, information and communications technologies is driving new value creation in industrial automation.
- Articulate the role 5G is playing in meeting the automation needs of Industry 4.0.
- Map 5G-enabled horizontal applications to the business needs and technology performance requirements of industry.
- Describe how these 5G-enabled horizontal applications apply to specific use-cases in the public safety, transportation and manufacturing industries.
- Apply your knowledge from the course to the business challenges and initiatives of the Port of Hamburg, and your own business environment.

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