Welcome to 5G

5G_101d | On-Demand | 5G Core | Express
Course Duration: 1 hour

5G promises to enable a wide variety of new wireless communications services and capabilities, ranging from high-speed, high-capacity broadband access to extremely reliable low-latency communications to machine-type communications on a massive scale. To deliver on these promises, everything about the wireless network must change, including the devices, the radio interface, the radio access network (RAN), and the core network. This self-paced eLearning course is for both technical and non-technical students, offering a high-level end-to-end overview of 5G networks. It explores use cases for different verticals, 5G network architecture, 5G device types, 5G air interface including the use of mmW spectrum and massive MIMO, and deployment scenarios.

Intended Audience

This course provides an end-to-end overview of 5G networks and is targeted for a broad audience – both technical and non-technical. This includes those in sales, marketing, deployment, operations, and support groups.

Objectives

After completing this course, the student will be able to:

- Identify the motivations and goals for 5G networks
- Sketch the end-to-end architecture of a 5G network
- Describe the types of devices supported in 5G networks
- Summarize the basic concepts of 5G air interface while using various spectrum bands
- Sketch the high-level architectures of the 5G NG-RAN and 5GC/NGC
- List various services being supported in 5G networks
- Illustrate the deployment and interworking solutions for 5G

Course Prerequisites

No Prerequisites

Outline

1. Motivations for 5G
1.1 5G use cases
1.2 eMBB
1.3 URLLC
1.4 mMTC
1.5 5G goals and targets
1.6 5G building blocks

2. 5G Devices
2.1 Multiplicity of devices
2.2 IoT devices and non-IoT devices
2.3 Device capabilities

3. 5G Network Architecture Overview
3.1 5G architecture goals
3.2 5G network components
3.3 5G NG-RAN
3.4 5G core network
3.5 Network slicing
3.6 MEC

4. 5G NR Air Interface
4.1 Variety of spectrum bands for 5G
4.2 Massive antennas for mmW
4.3 Reuse of OFDM/OFDMA concepts
4.4 Flexible OFDM numerologies
4.5 Flexible frame and slot structure

5. 5G NG-RAN
5.1 Split architecture
5.2 gNB-CU and gNB-DU
5.3 Transport network

6. 5G Core Network
6.1 5G Core Network functions
6.2 Control and User Plane separation
6.3 Service-based architecture

7. 5G Deployment
7.1 NSA and SA deployment options
7.2 Interworking with 4G LTE
7.3 Deployment considerations

Putting It All Together

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