# 5G\_

# 5G (SA) RAN Signaling and Operations Part 1: 5G RAN Essentials

## 5G\_211d | On-Demand | 5G Access | Expanded

**Course Duration:** 4 hours

This is the first course in a six-course set of self-paced courses encompassing 5G SA RAN Signaling and Operations. In this course, you will learn about the 5G SA RAN architecture and interfaces as well as the life of a 5G device in a 5G SA deployment from a RAN signaling and operations perspective. This course includes a review of key 5G New Radio (NR) air interface capabilities needed to put RAN architecture and operations into context. Each course in this six-course set can stand on its own or can be combined with other courses as necessary to meet your learning objectives.

#### **Intended Audience**

5G RAN and device engineering, operations, and performance related job functions

#### **Objectives**

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

- Describe the interfaces and protocols related to 5G NR RAN signaling
- Step through the life of a 5G UE in SA (Option 2) deployment
- Review key functionalities of 5G NR such as flexible numerology, beamforming

### **Course Prerequisites**

**5G NR Air Interface** 

#### Outline

- 1. 5G Standalone (SA) RAN Overview: RAN Essentials
- 1.1 5G SA RAN split architecture gNB-CU, gNB-DU
- 1.2 Use of interfaces: NR, N1, N2, N3
- 1.3 Role of protocols like PHY, MAC, RRC, PDCP, NAS
- 1.4 gNB related interfaces F1, Xn
- 1.5 5G RAN performance targets and solutions
- 1.6 NR Numerology and Frame Structure
- 1.7 Role of beamforming and MIMO
- 1.8 Bandwidth adaptation (BWP)

Exercise: 5G SA RAN architecture and interfaces

- 2. 5G SA RAN Overview: UE Operations in 5G SA Overview
- 2.1 5G NR air interface overview
- 2.2 Life of a UE in 5G SA network

Exercise: 5G SA operations

- 3. 5G NR Air Interface Overview
- 3.1 Key features of 5G NR air interface
- 3.2 NR Numerology and Frame Structure
- 3.3 Synchronization Signals and Broadcast Channel (SS/PBCH)

Assessment

