



# 5G (SA) RAN Signaling and Operations Part 2: Network Acquisition

5G\_212d | On-Demand | 5G Access | ⚙️

Course Duration: 4 hours

This is the second course in a six-course set of self-paced courses encompassing 5G SA RAN Signaling and Operations. In this course, you will learn about network acquisition for a device in a 5G standalone RAN. You will explore how a device finds and downlink synchronizes with a 5G New Radio cell, reads system information needed for cell selection and uplink synchronization, and establishes dedicated communications with the cell. 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 steps of preparing to monitor 5G SA cell and 5G network acquisition
- Summarize the Random Access (RACH) operation
- Explain the details of RRC connection setup with the gNB

## Course Prerequisites

[5G NR Air Interface](#)

## Outline

1. Downlink Sync and System Information
  - 1.1 Cell acquisition and RACH operation
  - 1.2 Power on sequence for a device in 5G SA
  - 1.3 SSB and beam sweeping
  - 1.4 Beam association on network acquisition
  - 1.5 Cell search operation using SS/PBCH
  - 1.6 SSB measurements
  - 1.7 System Information: MIB and SIB1
  - 1.8 Cell selection criteria

Exercise: Network acquisition

2. Uplink Synchronization and RRC Setup

- 2.1 Uplink synchronization using RACH

Exercise: RACH configuration

Exercise: Preamble power control parameters

Exercise: Preamble power calculations

- 2.2 RRC connection setup

Assessment