

5G NR Systems and Fundamentals eLearning Program

Get the best education quickly from trusted 5G experts

eLearning Program Overview

A complete and focused set of eLearning modules to help you find success with your Keysight investment at your pace. Includes 3GPP Release 16, 2020.

What you will learn

Build a strong foundation and understanding of the 5G NR network, air interface, and signaling protocols to get the most productivity and value from Keysight 5G measurement solutions.

It is also helpful for all 5G engineers and technicians to understand 5G networks and how devices interact with the network. You will learn more about:

- Deployment modes and options, and Dual Connectivity
- Network architecture, including network nodes and their functions, as well as cloud-based network slicing
- Air interface waveforms and frequencies, plus new improvements such as flexible numerology and beamforming
- Network protocols on layers 2 and 3, as well as security and mobility management

New included topics

- New frequency bands that enable the use of unlicensed spectrum
- UE positioning techniques
- Integrated Access backhaul for improved 5G backhaul connectivity
- Dynamic Spectrum Sharing (DSS) between 5G NR and 4G LTE
- URLLC, V2X, and MIMO enhancements to improve connectivity and throughput
- Cross-link and remote interference mitigation techniques
 - Mobility enhancements like two-step Random Access Procedure and RACH-less handover in synchronous networks



Keysight Services helps you improve productivity and product quality with comprehensive service offerings:

www.keysight.com/find/services

One-stop shop for:

- Calibration
- Repair
- Asset Management
- Technology Refresh
- Consulting
- Training

Who should attend?

5G wireless engineers, technicians, and engineering students who develop and test 5G-enabled chipsets, devices, and network elements, or deploy and operate 5G networks.

- A prior knowledge of LTE systems and air interface is preferred

Delivery method

State-of-the-art self-paced eLearning modules developed by Keysight experts.

5G NR System and Fundamentals eLearning Program

(T6600A-100 e-learning 5G NR Fundamentals Bundle – English)

eLearning Module	What you will learn	Duration
5G System Evolution	Evolution of Telecommunication 5G System – an Introduction 5G-4G comparison Key Telecom Concepts	1 hour
5G Network Architecture and Functionality	Deployment Options in 5G 5G Network Architecture 5G Core Nodes UE Dual Connectivity	1.5 hours
NR Air Interface Part 1	Multiple Access Techniques (Physical Layer) Scalable Numerology Frame Structure Changes LTE to 5G NR Bandwidth Part Operation	3 hours
NR Air Interface Part 2	DL Physical Channels and Reference Signals UL Physical Channels and Reference Signals Sidelink Channels and Procedures Interferences and Mitigation Techniques	
NR Air Interface Part 3	Massive MIMO MIMO Configuration Beam Management	
NR Air Interface Part 4	Initial Access Power Control Carrier Aggregation Enhancements for URLLC	
Network Interface Protocols Part 1	Medium Access Control (MAC) Radio Link Control (RLC) Packet Data Convergence Protocol (PDCP) Service Data Adaptation Protocol (SDAP)	2 hours
Network Interface Protocols Part 2	RRC Layer Functions 5G Mobility 5G System Security	
Summary - 5G Use Cases and Key Enablers	List of 5G Key Use Cases List of changes, from 4G, implemented in the network architecture, air interface, and protocols to meet the 5G requirements	0.5 hour
Assessment – 5G Systems and NR Fundamentals		
Program package	All modules, as described above	8 hours

Next step

Sign up today at [keysight.com/find/EducationServices](https://www.keysight.com/find/EducationServices)

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications, or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

