

# 5G Overview, New Radio, New Core

This course gives an overview about the evolution of mobile networks towards 5G and into the concepts of New Radio, New Core and its services. It discusses the use cases that are foreseen and their requirements on 5G. The new network architecture is presented, the new air interface, core structure and procedures are explained.

## Target group / Prerequisites

Technicians, engineers and technical management personnel which work on tasks in mobile networks. The participants should have a good knowledge on the existing mobile network standards, especially on LTE.

## Course contents

### Introduction

- Evolution of mobile networks
- 3GPP Standards and the timeline for 5G
- Traffic growth
- Standardization

### What should 5G be able to?

- Use cases and their prerequisites
- ITU targets
- KPIs

### Network architecture

- Service based network architecture
- 5G SA and NSA Architecture
- CUPS
- DECOR
- Mobile Edge Computing, NFV, SDN
- Network Slicing
- Cloud-RAN
- Dual Connectivity
- Migration concepts from 4G to 5G
- WLAN Offloading and unlicensed Access

### Spectrum

- Properties of mm-waves
- Frequency Ranges
- Frequency bands, Bandwidth, Bandwidth parts
- Carrier Aggregation, Supplementary Uplink

### Air Interface

- Modulation, Duplex- and Multiple Access
- New Numerology
- NR Resource grid, Common and Physical Resource Blocks
- Channels and Signals

**Duration:**

4 days

**Course ID:**

NW1263

**Prerequisites:**

Good knowledge of LTE

- Synchronisation and Cell Search Procedure, System Information
- Random Access, HARQ and Power Control

#### **Massive MIMO**

- Antenna system, classic MIMO
- Massive MIMO
- Analogue, digital and hybrid Beamforming, Beam Switching

#### **Protocols and Procedures**

- Protocol stacks
- 5G Identities
- User Plane Function Selection
- Procedures for Registration and Session Management
- Mobility and Handover
- PLMN Selection

#### **5G QoS, Voice and other Services**

- QoS Concept in 5G
- Implementation of Voice service over 5G
- VoNR, VoLTE, EPS and RAT Fallback
- Emergency Services

#### **Further Standardization**

- Features and Study Items for Rel. 16 and 17
- Integrated Access and Backhaul
- SON, Satellite Support

### **Certification**

Certificates are given to all participants at the end of the course about the successful completion.

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### **Course Registration:**

Please contact us via

- phone: +49 89 1894354-405
- email: [training@tfk-technologies.de](mailto:training@tfk-technologies.de) or
- via our website <https://skilleap.com/courses>

You will receive a confirmation of your registration. We can also advise you concerning the best combination of course contents.

For clients with special requirements the optimal training concept can be customized. Modules from our training portfolio can be combined to meet your company-specific needs.