Course ID	Course Title
5G-BH-PN	**5G Mobile Backhaul & 5G Private Networks**
Course Duration	
2-4 days	

Aimed At   *5G Mobile Backhaul & 5G Private Networks* is aimed at technical professionals in the commercial, homeland security, or defense sectors.

Prerequisites   *5G Mobile Backhaul & 5G Private Networks* course requires prior knowledge of 5G wireless such as may be acquired by taking the Eogogics course *5G Wireless Technology/Applications* (5GTA, 5 days).

Related Courses   See the Eogogics 5G curriculum.

Course in a Nutshell   The objective of this dual-focus course is to study the 5G Mobile Backhaul as well as the 5G Private Networks. The content of this course is continually updated to synch with the evolving state-of-the-art of 5G Wireless Technology.

Customize It!   We can tailor the included topics, tech level, and duration of *5G Mobile Backhaul & 5G Private Networks* to your team's technical requirements.

Outline   *5G Mobile Backhaul & 5G Private Networks* **- Section 1:   5G Non-Public (Private) Network (NPN) Architecture**
- Private Network Use Cases and Drivers
    - Limitations of Public Networks
    - Use Cases for Private 5G.
    - Challenges
- Technology Choices for Private Network
    - LTE
    - CBRS
    - WiFi
    - 5G NR-U and NR-LAA
- Private 5G Spectrum Usage
    - Spectrum Requirements.
    - Licensed Spectrum
    - Shared Spectrum (CBRS)
    - 5G in Unlicensed Spectrum
- 5G Standalone Non-Public Network (SNPN)
    - Architecture
    - Identifiers

- o Network Access and Network Selection
- 5G Public Network Integrated Non-Public Network (PNI-NPN)
  - o Architecture
  - o Identifiers
  - o Network Access and Network Selection
- Non-Public Network Deployment Options
  - o NPN as a Network Slice of PLMN
  - o MOCN, MORN
  - o Network Slicing
- PLMN-ID and other Identifiers in Private Networks
- Security in 5G NR Private Network
- Supporting Mission Critical in 5G Private Network

5G Mobile Backhaul & 5G Private Networks - **Section 2:   5G NPN Enablers**
- Edge Computing in 5G
  - o MEC Basic Concepts
  - o MEC Architecture
  - o SBA: 5G and MEC Integration
- Open Interface for Open RAN
- 3GPP RAN and Functional Split
- Functional Split Options
  - o F1 Interface
  - o E1 Interface
- O-RAN Architecture
  - o O-RAN Interfaces
  - o OAM Architecture
  - o O-RAN Interfaces
- C-RAN vs. O-RAN
  - o 3GPP 5G C-RAN Architecture:
- Fronthaul Technologies for Open RAN
  - o CPRI
  - o eCPRI
  - o ETSI ORI

5G Mobile Backhaul & 5G Private Networks - **Section 3:   LTE and 5G NR Backhaul**
- Challenges in Mobile Backhaul
- Technology Choices for Mobile Backhaul
- LTE as Backhaul.
  - o Use case
  - o Performance
- 5G NR as Backhaul

- o Use Case
- o Performance
- Alternative Architectures for Mobile Backhaul Optimization
- Integrated Access Backhaul (IAB)
  - o Overall Architecture
  - o Protocol Stacks
  - o User-plane Aspects
    - Backhaul Transport.
    - Flow and Congestion Control
    - Uplink Scheduling Latency
  - o Signaling Procedures
    - IAB-node Integration
    - IAB-node Migration
    - Topological Redundancy
    - Backhaul RLF Recovery
    - OTA Timing synchronization
    - Inter-node Discovery.
  - o 5G NR Identities for IAB
  - o 5G NR Ran Split for IAB
    - IAB Node Integration

5G Mobile Backhaul & 5G Private Networks - **Section 4:   5G NR Spectrum Planning for Public Safety and Mission Critical**
- 700 MHz Deployment in 5G NR
  - o Spectrum Planning
  - o Coverage Improvement in 5G NR
- Downlink Link 5G NR Link Budget
- Uplink Link 5G NR Link Budget

5G Mobile Backhaul & 5G Private Networks - **Wrap-up: Recap and Discussion**

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