



MCNS Training Program

5G RAN KPI Analysis, Optimization & Troubleshooting

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This course will offer delegates a good and deep understanding about 5G NSA/SA RAN statistical observability, also about 5G NSA/SA RAN performance analysis, optimization and troubleshooting and finally to introduce RAN planning and optimization hints

COURSE REVIEW

This 5G training course leads the audience into a good understanding of the MIMO/mMIMO radio channel modeling and impairments. **It explains how OFDM is coupled to MIMO/mMIMO performance** and give optimization hints on radio channel impairment performance.

It gives good insight on how CSI ports are related to channel estimation, emphasizing on how RAN performance is biased by the MIMO/mMIMO beamforming, System level SINR parameter. It analytically explains how throughput is related to MIMO/mMIMO along with real KPI behavior. The course is supported by mathematical analysis, simulation results and drive measurement analysis results.

AIMED AT

This course is mainly aimed at a technical audience. It is suitable **for 5G RAN Engineers, Radio Planners, Network Optimization Engineers, System Engineers and Researchers and finally Advanced Telecom Trainers and Architects**, who currently are or will be involved in deploying and designing 5G networks and services.

Prerequisites: Those wishing to take this course should have an introductory level of understanding on **5G Physical Layer and 5G RAN technology**.



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Course Benefits for individuals (Professionals)

- Participants gain strong insight into the end-to-end relationship between air-interface behavior, RAN configuration, and network performance
- Learning how low-level radio conditions and protocol procedures translate into high-level performance indicators
- Special emphasis is placed on identifying root causes behind performance degradation, distinguishing between coverage-, capacity-, interference-, mobility-, and configuration-driven issues in both NSA and SA architectures

Course Benefits for your Organization

The training introduces RAN planning and optimization guidelines, Links KPI behavior with planning assumptions, cell design choices, and parameter tuning
The course is supported by realistic examples, case studies, and KPI-driven scenarios
Allows participants to develop the analytical skills required to optimize and troubleshoot 5G RAN networks efficiently in live operational environments

Training Format

Instructor-Led Training
On-Site Classroom: 3 days
Web delivered (Virtual): 3 days
Excellent and descriptive course material (pdf file) will be provided

Customer Tailored!

We can tailor the included topics, tech level, and duration of this course right to your team's technical requirements and needs



Course Program Outline

Module 1: 5G NSA/SA Statistical Measurements

- 5G NSA architecture
- Basic overview of NSA/SA signaling scenarios
- 5G NSA Statistical measurements on eNodeB
- 5G NSA/SA Statistical measurements on gNB
- General performance analysis on network capacity and availability



Course Program Outline

Module 2: 5G NSA/SA Accessibility

- 5G NSA RACH procedure
- 5G SA RACH Procedure
- Performance analysis for 5G NSA/SA accessibility success rate
- 5G SA Session Setup success rate (SSSR) - analysis and troubleshooting
- Performance success rate estimation (math modeling)
- Most Common trouble-shooting analysis based on KPIs



Section 3: 5G RAN Retainability/Mobility

Course Program Outline

Module 3: 5G NSA/SA Retainability

- 5G NSA EN_DC establishment success rate
- 5G NSA EN_DC DRB retainability analysis and troubleshooting
- 5G SA retainability - analysis and Most Common troubleshooting analysis based on KPIs

Module 4: 5G NSA/SA Mobility

- 5G NSA EN_DC mobility analysis (eNodeB & gNB) and troubleshooting
- 5G SA Mobility analysis - analysis and troubleshooting
- Most Common troubleshooting analysis based on KPIs



Section 4: 5G RAN Capacity Performance

Course Program Outline

Module 5: 5G NSA/SA Throughput

- 5G NSA EN_DC DRB throughput rate and troubleshooting
- 5G NSA EN_DC PDCP throughput rate and troubleshooting
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- 5G SA DRB throughput analysis and troubleshooting
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- 5G SA PDCP throughput analysis and troubleshooting
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- Most Common trouble-shooting analysis based on KPIs

Module 6: 5G NSA/SA Capacity Performance

- 5G NSA/SA RRC connected users analysis and troubleshooting
- 5G NSA/SA data connected users analysis and troubleshooting
- 5G NSA/SA PUCCH SINR analysis and troubleshooting
- 5G NSA/SA CQI analysis and troubleshooting
- 5G NSA/SA HARQ analysis and troubleshooting
- 5G NSA/SA Interference analysis and troubleshooting

