5G Network Architecture, Design Planning & Optimization

Brief about Course

5G Network planning gives an overview of the various planning methods and processes which are applicable from the 4G era, and all new considerations for 5G technology. Key requirements for 5G planning include flexibility and high reliability, need for multiple network and radio access technology layers , high mobility and connectivity between networks and devices, precise positioning and high security. 5G planning and design tools deliver radio planning capabilities that are needed to design the best 5G network possible. 5G NR modelling has advanced propagation models, complex antenna arrays and full multi-technology capacity simulation are all supported. Various planning tools are available like ASSET which can perform simultaneous planning of wireless networks across all technologies like GSM, 3G, 4G, 5G and all other supported technologies. Advanced network modelling uses Geo, PM, CM and marketing inputs, multi-height predictions, 3D building data and advanced propagation models to deliver technology modelling. Planning can be used for Site placement, PCI planning, RACH planning , neighbor planning , network design optimization etc. Coverage and capacity are two fundamental requirements for a cellular network. Radio propagation model is essential for the coverage planning of cellular networks. For 5G New Radio , true multi-path information is needed to generate MIMO channel matrix,which is essential to evaluate the performance of massive MIMO. The propagation model which is used for 5G NR massive MIMO is 3D multi-path ray tracing / launching. For 5G NR system modelling , 5G NR numerologies must be required to be modelled in a planning tool.

Course Benefits

- Understand 5G concepts, enablers and key features
- Explore 5G core architecture and the backwards-compatibility of 5G
- Analyse key use cases and their mapping to carriers and applications/services
- Understand SDN, NFV and cloudification, benefits and user/control plane design
- Delve into IoT radio access, design principles and functions of edge computing
- Explore Big Data and machine learning in network diagnostics and fault detection

Who is it for?

The course is designed for operators, vendors and regulators looking to upskill their knowledge on how to plan and design a 5G network.

Programme Modules

- Expectations on 5G
- Radio Access Architecture
- Backbone and Core I: Software Defined Networking
- Virtualisation
- IoT and Edge Computing
- 5G Security

Benefits For Professionals

- Understand 5G concepts, enablers and key features
- Explore 5G core architecture and the backwards-compatibility of 5G
- Dive into spectrum, interfaces and coding in 5G New Radio
- Learn how to utilise cluster methods for centralized/virtual radio access planning
- Understand SDN, NFV and cloudification, benefits and user/control plane design

Key Content:

- Radio Access Architecture
- Software defined Networking
- Virtualization
- IoT & Edge Computing
- 5G Security
- Operation Control and Management
- Challenges of 5G Radio Planning
- 5G NR Radio Planning Process
- 5G Spectrum Planning
- Radio Propagation for 5G
- 5G NR Link Budget
- 5G Throughput and Capacity
- 5G Network Optimization process & Challenges
- 5G Network KPI

About Organizer:

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