Understanding LTE/4G Network Evolution and Maintenance Training Course

Ref: #TEL3948

Course Introduction / Overview:

This training course is designed to provide telecom engineers, network administrators, and IT professionals with the foundational knowledge and technical skills needed to manage and maintain LTE/4G networks. As a vital component of modern communication, LTE/4G technology continues to evolve, serving as the backbone for mobile data and voice services worldwide. This program, offered by BIG BEN Training Center, provides a comprehensive framework for understanding LTE network architecture, core components, and the maintenance procedures required to ensure optimal performance. We will explore key concepts such as network optimization, troubleshooting techniques, and quality of service (QoS) management. The curriculum is informed by the academic work of authors like Erik Dahlman, whose book, 4G: LTE/LTE-Advanced for Mobile Broadband, provides a foundational and detailed understanding of LTE/4G technology. This course goes beyond a simple overview to provide a deep understanding of how to diagnose network issues and implement solutions that improve network reliability and user experience. We prepare participants to be skilled telecom professionals who can effectively manage LTE/4G infrastructure.

Target Audience / This training course is suitable for:

- Telecommunications engineers.
- Network operations center (NOC) technicians.
- Network maintenance personnel.
- IT administrators.
- Field engineers.
- System integration specialists.
- Wireless network planners.
- Government agencies and equivalents.

Target Sectors and Industries:

Telecommunications.

- IT and Managed Services.
- Mobile Network Operators (MNOs).
- Internet Service Providers (ISPs).
- Public Safety and Government.
- Manufacturing.
- Consulting.
- Defense.

Target Organizations Departments:

- Network Operations.
- Network Engineering.
- Field Maintenance.
- IT Infrastructure.
- Quality Assurance.
- Technical Support.
- Radio Access Network (RAN) Planning.
- Research and Development (R&D).

Course Offerings:

By the end of this course, the participants will have able to:

- Understand the architecture of an LTE/4G network.
- Perform routine network maintenance tasks.
- Troubleshoot common network performance issues.
- Analyze network logs and metrics.
- Optimize LTE network performance and capacity.
- Manage quality of service (QoS) for various applications.
- Implement security protocols for LTE networks.
- Identify and resolve inter-cell interference.

Course Methodology:

This training course uses a highly practical and hands-on methodology. The program is built on real-world scenarios and simulations of common LTE network issues. Participants will work in a simulated network environment to practice troubleshooting and maintenance procedures. We will use interactive workshops to deep dive into specific topics, from core network components to RAN optimization. The curriculum is designed to be a collaborative experience where participants can share their unique challenges and innovative solutions. Our trainers, with extensive experience in the field, will provide direct feedback and guidance throughout the course. BIG BEN Training Center is committed to providing a dynamic and practical learning environment, ensuring that participants leave with the skills and confidence to effectively manage LTE/4G infrastructure.

Course Agenda (Course Units):

Unit One: Introduction to LTE Architecture

- Evolution from 2G/3G to LTE/4G.
- Core network components.
- Radio access network (RAN) architecture.
- LTE protocols and signaling procedures.
- E-UTRAN and EPC overview.
- VoLTE and SMS over IP.
- Network elements and interfaces.

Unit Two: LTE Network Operations and Maintenance

- Routine network health checks.
- Performance monitoring with key indicators.
- Network alarms and event management.
- Using network management systems.
- Hardware maintenance procedures.
- Software upgrades and patches.
- Predictive maintenance strategies.

Unit Three: Performance Optimization and Troubleshooting

- Network performance parameters.
- Common troubleshooting techniques.
- Analyzing call setup failures.
- Resolving dropped calls.
- Interference analysis and mitigation.
- Capacity planning and management.
- Quality of Service (QoS) optimization.

Unit Four: Network Security and Interoperability

- LTE network security threats.
- Authentication and encryption protocols.
- IPsec and VPN in LTE.
- Network slicing for security.
- Interoperability with other technologies.
- Handover procedures and challenges.
- Roaming and network integration.

Unit Five: The Future of Mobile Networks

- Evolution to 5G and beyond.
- The role of LTE-Advanced.
- Emerging mobile technologies.
- IoT and its impact on networks.
- Leadership in network management.
- Career pathways in telecom.
- The future of wireless communication.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can LTE/4G network maintenance be transformed from a reactive process of fixing issues to a proactive strategy of predictive analysis and continuous optimization?

What unique qualities does this course offer compared to other courses?

This training course is unique because it provides a dedicated, strategic focus on the practical maintenance and troubleshooting of LTE/4G networks. While other programs may cover telecom theory, our curriculum is designed to empower professionals with the specific skills needed to manage and maintain real-world LTE infrastructure. The program is a hands-on experience, with exercises that directly simulate the challenges and decisions involved in a real-world network operation center. We go beyond theoretical concepts to provide a clear, actionable roadmap for ensuring network reliability and optimizing performance. This course is for professionals who want to lead their organizations toward a more resilient and efficient mobile future.