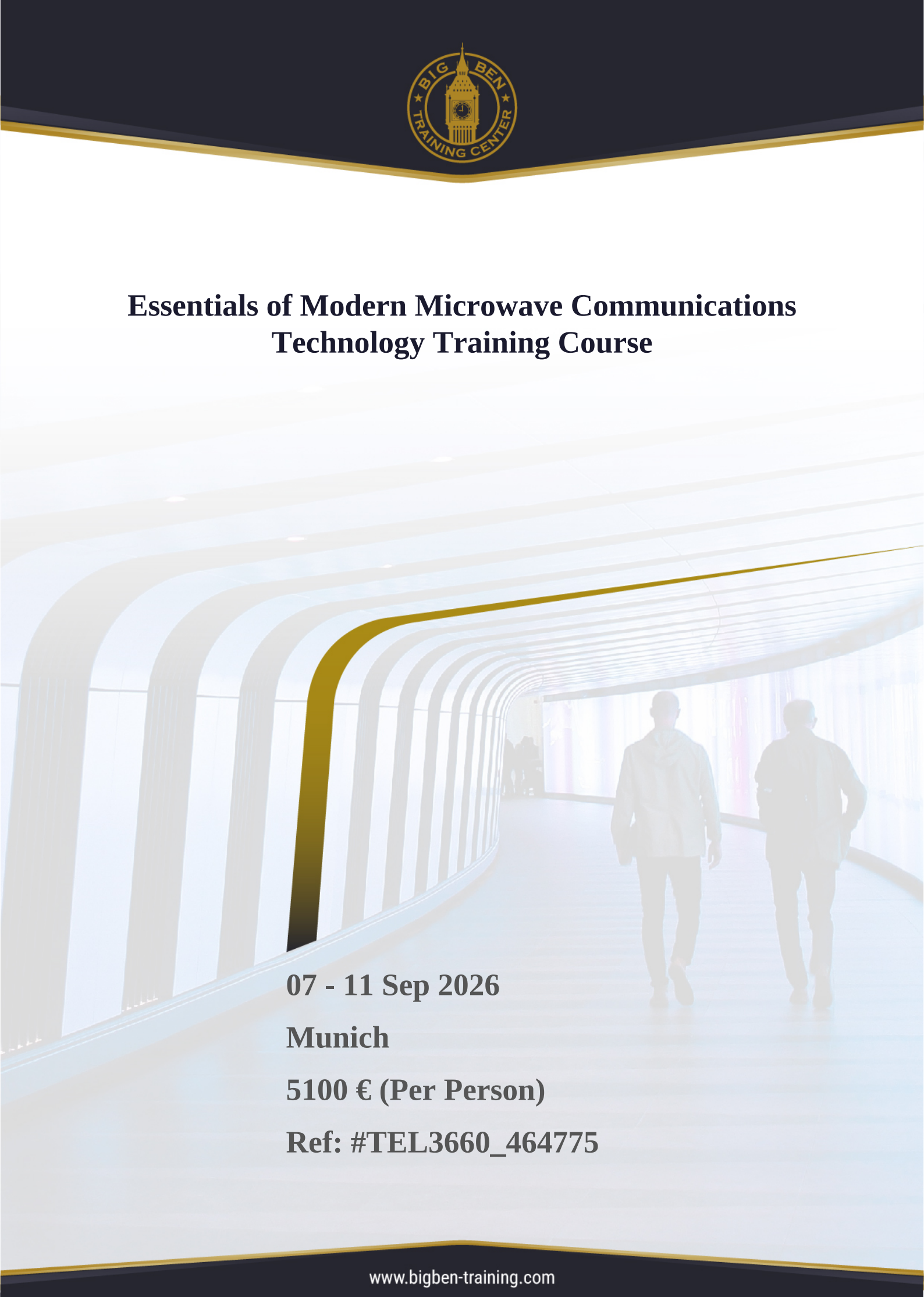
Essentials of Modern Microwave Communications Technology Training Course



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Munich

5100 € (Per Person)

Ref: #TEL3660_464775

Course Introduction / Overview:

This training course is designed to equip telecom engineers, network planners, and IT professionals with the foundational knowledge and technical skills needed to understand and work with microwave communications technology. As a critical component of modern telecommunications infrastructure, microwave links provide high-capacity, reliable wireless backhaul for cellular networks and other vital services. This program, offered by BIG BEN Training Center, provides a comprehensive framework for understanding the principles of microwave transmission, from path analysis and frequency planning to link design and troubleshooting. We will explore key concepts such as line-of-sight analysis, path loss calculation, and interference mitigation. The curriculum is informed by the academic work of authors like Joseph E. Carruthers and John P. Hagon, whose book, Microwave Communications, offers a foundational and detailed understanding of microwave technology and its practical applications. This course goes beyond a simple overview to provide a deep understanding of how to design and maintain microwave links that ensure high-performance and reliability. We prepare participants to be skilled telecom professionals who can effectively manage microwave infrastructure.

Target Audience / This training course is suitable for:

- Microwave engineers.
- Network planners.
- RF engineers.
- Telecommunications technicians.
- Field operations personnel.
- System integrators.
- Wireless network designers.
- Government agencies and equivalents.

Target Sectors and Industries:

- Telecommunications.
- IT and Managed Services.
- Mobile Network Operators (MNOs).
- Internet Service Providers (ISPs).
- Broadcast and Media.
- Public Safety and Government.
- Defense.
- Utilities.

Target Organizations Departments:

- Network Engineering.
- Network Planning and Optimization.
- Field Operations.
- IT Infrastructure.
- Technical Services.
- Radio Access Network (RAN) Operations.
- Research and Development (R&D).
- Strategic Planning.

Course Offerings:

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

- Understand the fundamental principles of microwave transmission.
- Perform microwave design and planning.
- Analyze and calculate path loss and link budget.
- Identify and mitigate sources of interference.
- Master frequency planning techniques.
- Troubleshoot common microwave link issues.
- Ensure link reliability and availability.
- Implement microwave solutions for wireless backhaul.

Course Methodology:

This training course uses a highly practical and hands-on methodology. The program is built on real-world scenarios and simulations of microwave link design and troubleshooting. Participants will work in a simulated planning environment to practice path analysis and link budget calculations. We will use interactive workshops to deep dive into specific topics, from antenna selection to fading analysis. 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 microwave communications.

Course Agenda (Course Units):

Unit One: Principles of Microwave Communications

- Introduction to microwave technology.
- Microwave frequency bands.
- Wave propagation and path characteristics.
- Line-of-sight (LOS) vs. Non-line-of-sight (NLOS).
- Fading and its effects.
- Fresnel zones and clearance.
- Components of a microwave system.

Unit Two: Link Design and Path Analysis

- Microwave link design principles.
- Path survey and site selection.
- Link budget calculation.
- Antenna selection and mounting.
- Radio equipment types and specifications.
- Rain fades and atmospheric absorption.
- Geographic data and mapping tools.

Unit Three: Frequency Planning and Interference

- Frequency planning strategies.
- Interference analysis and mitigation.
- Channelization and bandwidth.
- Spectrum management.
- Co-channel interference.
- Adjacent channel interference.
- Regulatory aspects of frequency use.

Unit Four: Troubleshooting and Maintenance

- Common microwave link failures.
- Troubleshooting methodologies.
- Using network management systems.
- Analyzing alarms and events.
- Hardware maintenance and inspection.
- Performance monitoring and optimization.
- Link availability and SLA.

Unit Five: Strategic Implementation and Future Trends

- Microwaves backhaul for cellular networks.
- Hybrid network solutions.
- Future of microwave communications.
- Integration with 5G.
- Leadership in network planning.
- Career pathways in microwave engineering.
- The future of wireless backhauls.

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 a deeper understanding of microwave communications allow network professionals to strategically use these links as a powerful tool for network expansion and resilience, rather than just as a basic connectivity solution?

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 design and implementation of microwave communication links. While other programs may cover general telecom theory, our curriculum is designed to empower professionals with the specific skills needed to plan, deploy, and manage real-world microwave infrastructure. The program is a hands-on experience, with exercises that directly simulate the challenges and decisions involved in a link budget calculation or interference analysis. 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 efficient, high-performing, and resilient network.