BLACKBIRD FOR TRAINING

Microwave Transmission Link Design & Network Planning

25 – 29 January 2027
Lisbon (Portugal)



Microwave Transmission Link Design & Network Planning

Ref: 321422_139708 **Date:** 25 – 29 January 2027 **Location:** Lisbon (Portugal) **Fees:** 5900 GBP

Why This Course

Microwave transmission remains a critical backbone technology for modern telecommunications networks, supporting mobile backhaul, enterprise connectivity, and long-haul communications. As networks expand and demand for capacity, reliability, and availability increases, engineers must be able to design microwave links that perform reliably under real-world conditions.

The **Microwave Transmission Link Design & Network Planning Excellence Program** is an intensive one-week course designed for telecommunications engineers, planners, and technical professionals involved in microwave network design and optimization. The program provides a structured understanding of microwave propagation, link budget analysis, frequency planning, and network optimization—bridging theory with hands-on application.

Through practical exercises, industry-aligned methodologies, and real-world scenarios, participants develop the technical confidence required to design and manage high-performance microwave networks.

What You'll Learn and Practice

By the end of this program, participants will be able to:

- Understand microwave propagation principles and their impact on link performance
- Perform accurate link budget calculations and availability analysis
- Design microwave links that meet capacity, reliability, and quality targets
- Develop effective frequency plans and mitigate interference
- Optimize microwave networks for traffic growth and resilience
- Use industry-standard planning tools and software confidently

The Program Flow 1-Week Structure

Day 1 - Fundamentals of Microwave Transmission

- Overview of microwave communication systems and applications
- Microwave propagation principles and path behavior
- Antenna theory, characteristics, and selection
- Free-space path loss, atmospheric effects, and terrain considerations



Day 2 - Link Budget Analysis & Performance

- Link budget components and step-by-step calculations
- Fade margin concepts and availability prediction
- Modulation techniques and adaptive modulation schemes
- Error performance, throughput, and quality of service QoS

Day 3 - Frequency Planning & Management

- Frequency allocation, licensing, and regulatory considerations
- Channel arrangements, bandwidths, and polarization techniques
- Interference analysis, coordination, and mitigation methods
- Frequency reuse strategies and spectrum efficiency

Day 4 - Network Planning & Optimization

- Microwave network topology and architecture design
- Capacity planning and traffic engineering principles
- Reliability, protection schemes, and redundancy planning
- Network management systems and performance monitoring

Day 5 - Advanced Topics & Practical Application

- High-capacity and long-haul microwave link design
- Microwave backhaul solutions for mobile and broadband networks
- Using software tools for link design and network planning
- Case studies and real-world microwave deployment scenarios

Individual Impact

Participants will leave the program with:

- The ability to design and optimize microwave links with confidence
- Practical experience in link budget analysis and performance evaluation
- Strong skills in frequency planning and interference management
- Greater confidence using professional microwave planning tools
- A structured approach to microwave network design and optimization

Organizational Impact

Organizations will benefit through:



- More reliable and higher-performing microwave networks
- Improved spectrum efficiency and reduced interference issues
- Better planning for capacity growth and network resilience
- Reduced design errors and deployment risks
- Stronger technical capability within engineering teams

Training Methodology

The program follows a practical, engineering-focused learning approach, including:

- Step-by-step technical exercises and calculations
- Real-world microwave design case studies
- Hands-on use of planning and simulation tools
- Group problem-solving and design workshops
- Expert-led instruction grounded in telecom industry practices

Beyond the Course

After completing the program, participants will be ready to:

- Design and deploy microwave links for diverse applications
- Optimize existing microwave networks for performance and scalability
- Support mobile backhaul and high-capacity transmission requirements
- Contribute effectively to telecom network planning and engineering teams

