

Microwave Radio Fundamentals

Course Length	3 days
Course Code	NFSRF1
Prerequisites	A fundamental understanding of telecommunications transmission principles will be useful for students taking this course.
Course Overview:	This course will introduce the student to basic RF fundamentals as well as discuss modern applications for Microwave links and connections.

*This course can be customized or combined to meet specific system requirements

Course Outline

Introduction to Microwave

- Why Microwave
- Wavelength
- Radio Vs Fiber Vs Cable
- Broadband Vs Narrowband
- Radio Regulation in the US
- Bandwidth Defined
- Attenuation and Noise

Baseband and Interfaces

- Types of Basebands
- Types of Traffic
- Analog Basebands & Devices
- Digital Interfaces

Understanding Microwave Equipment

- Microwave Transmitters
- Analog Modulation
- Digital Modulation
- Microwave Receivers



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Microwave Propagation

- Maxwell & Waves
- Wave Attenuation
 - Free Space Loss
 - Absorption
 - Ducting & Fades
 - Reflections & Multi-Paths
- Fresnel Zone Clearance

Microwave Antenna Systems

- Antenna Gain & Bandwidth
- Directivity & Beam Width
- Antenna Types
- Connectors
- Radiating Devices
- Waveguide and Coax
- Antenna Testing
 - Alignment
 - Return Loss & TDR

The Microwave Link Budget and System Evaluation

- Link Budget
- System Gain and Loss
- Planning a Point To Point System
- Understanding Digital Microwave System Testing
- Interpreting Microwave Alarms



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