

Introduction to Propagation

Course Syllabus Overview

Duration – 5 days (Estimate)

01. Concepts

- Waves
- Electromagnetic Waves
- Dipole Radiation
- Gain
- Free Space Propagation
- Harmonic Dipoles
- Link Equation
- Communications Systems
- Complex Propagation

02. Electromagnetic Waves

- Plane Waves
- Anisotropic Media
- Boundary Conditions
- Transmission through an Interface
- Oblique Incidence

03. Propagation Modifiers

- Multipath Interference
- Hills and Mountains
- Diffraction
- Ground Bounce
- Urban Propagation
- The Horizon
- Cross Polarisation
- Trees and other Vegetation
- Heavy Rain, Snow or Fog

04. Ionospheric Duct

- Benign Ionosphere
- Disturbed Ionosphere
- Vertical Propagation
- Oblique Propagation
- Propagation Losses
- Fading
- Noise

05. Propagation in the Lower Atmosphere

- Tropospheric Ducts
- Topography
- Surface Waves
- Water

06. Propagation through the Ionosphere

- Benign Ionosphere
- Faraday Rotation
- Doppler Shift
- Scintillation

07. Radio Systems

- Transmission Lines to Antenna
- Matched Load Power Transfer
- Standing Wave Ratio
- Reflection Coefficient
- Transmission Line Types
- Transmission Line Characteristics

08. Antennas

- Dipole
- Monopole
- Loop
- Yagi
- Slot
- Circularly Polarised
- Patch
- Arrays

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