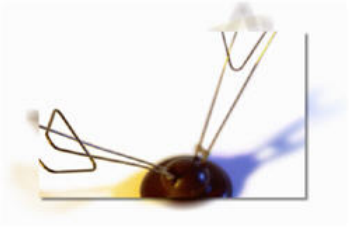
Radio & Transmission



The course provides a detailed understanding of the physical wave propagation channel, for Mobile Communication, between the transmitting and receiving antennas, including a description of the most relevant wave propagation effects. We examine modern models and tools for path loss calculations and radio channel modeling. The system perspective is maintained throughout the course.

Radio Wave Propagation

OBJECTIVES

· Know the basic wave propagation mechanisms and how they influence radio system performance and design
· Understand how trerrain and cell types influence the wave propagation
· Understand the impact on narrowband and wideband systems
· Know the basic principles for radio system coverage calculation and how to characterize the radio channel from a system point of view

INTENDED FOR TECHNICIANS WORKING WITH ..

· ..System Design
· ..Antenna and system maintanance
· .. Radio Network Design
· .. Cell Planning

PRECONDITION

· In order to fully benefit from the course, it is recommended that the participants have a basic knowledge of mobile communication systems and basic electronics knowledge

Standard - 1 day

Content

¤ **The Wireless communication channel**
- System influences
- Definitions and terminology
- The propagation model
- Free space
- Line of sight/No line of sight

¤ **Properties of electromagnetic waves**

¤ **Propagation mechanisms**
- Reflection
- Scattering
- Diffraction

¤ **Multipath propagation**
- Fading and fading effects
- Large and small scale fading
- Fast, slow, flat and frequency selective fading
- Intersymbol interference
- Impulse response
- Delay spread and coherence bandwidth
- Doppler spread and coherence time
- Narrowband and wideband system effects

¤ **Propagation environment**
- Open areas
- Hilly terrain
- Vegetation
- Built up areas
- Indoor
- Confined areas
- Sea paths
- Ionospheric paths

Aimed for

People with some previous experience from the Mobile Communication field.

Advanced - 1 day

Content

¤ **Cellular aspects**
- Macro cells
- Micro cells
- Pico cells

¤ **Propagation and channel models**
- Empirical and statistical models
- Okumura-Hata
- COST 231/Walfish-Ikegami
- Ray-tracing
- Keenan Motley
- GTD/UTD
- Parabolic equations
- Channel modeling for GSM and UMTS

¤ **Computer tools**
- Input data
- Reliability
- Field trials

Aimed for

People who need a thorough Radio Wave Propagation knowledge with examples of modeling, design and Computer tools.

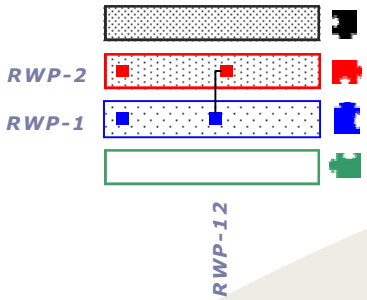
Radio Wave Propagation Products

RWP-1:Radio Wave Propagation (1 day)

RWP-2:Radio Wave Propagation models (1 day)

Product Combinations

RWP-12:RWP-1+2 (2 days)



Please call for more information ▶▶▶

Frendus Education

Strandgatan 2
SE-582 26 Linköping
Sweden

+46 13 125020
www.frendus.se, info@frendus.se