

# Mobile Funksysteme (Mobile Radio Systems)

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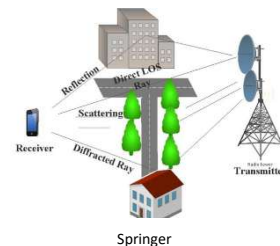
- Why does your Wi-Fi signal suddenly drop in the next room?**
- How can thousands of users share the same wireless channel?**
- Why do modern routers and smartphones use multiple antennas?**

Wireless communication shapes our everyday lives — from mobile networks and Wi-Fi to Bluetooth, LoRa, and emerging technologies. But what really happens behind the scenes?

This lecture goes beyond individual standards such as GSM, LTE, or 5G. Instead, we focus on the **fundamental principles** that govern all wireless systems. The concepts you will learn are universally applicable and essential for understanding both current and future communication technologies.

## What You Will Explore

- Signal propagation in mobile radio channels
- Fading, interference, and practical countermeasures
- Multi-user access and resource management
- Mobility in communication networks
- Quality of Service (QoS)



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## Questions We Will Answer

- Why do “dead zones” exist?
- Why does Wi-Fi performance vary between rooms?
- Why do modern systems rely on multiple antennas and where should they be placed?
- How are bandwidth and transmission power determined?
- How can uninterrupted communication be maintained while moving at high speed?

## Why This Lecture Matters

With this knowledge, you will be able to:

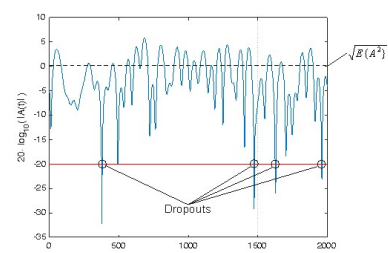
- Understand how wireless systems really work
- Confidently interpret modern communication standards
- Design and evaluate reliable wireless links at system level
- Select suitable radio modules and technologies for real applications
- Analyze how configuration parameters impact performance



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The course provides valuable foundations for fields such as:

- Wireless & RF Engineering
- Communication Networks
- System Design & Optimization



**Build the intuition behind wireless communication**