Mobile Communications Today

From GSM over LTE to 5G

Fundamental upheavals are taking place in mobile communications. For 30 years, GSM mobile communications and its extensions for Internet access GPRS & EDGE dominated worldwide. 3G UMTS & HSPA+ were also quite popular.

A few years ago, the much more powerful LTE began to replace its predecessors. And 5G, as an ultra-flexible and high-performance wireless standard for all applications and users, is making the leap to the mass market.

This course provides you with an overview of all the mobile radio systems relevant today: from 2G (GSM) to 2.5G (GPRS/EDGE), 3G (UMTS), 3.5G (HSPA/HSPA+), 4G (LTE) and 4.5G (LTE-Advanced Pro) through to 5G. You will gain a solid knowledge of mobile communications and be introduced to network architecture, radio transmission, service concept, security aspects, data rates, performance and limits of these mobile communications systems.

Course Contents

- Basics of Mobile Communications
- Cellular Systems, Hand-over, Roaming
- Evolution of Mobile Communications: from 1G to 5G Mobile radio basics
- Cellular systems, handover, roaming
- Mobile radio evolution from 1G to 5G
- GSM network architecture
- Packet Switched Domain: GPRS/EDGE
- UMTS/HSPA Network
- IP Multimedia Subsystem IMS
- LTE Network: Evolved Packet System EPS
- 5G Network: 5G System 5GS
- Tele-/Bearer & Supplementary Services
- Service Evolution
- Security in GSM, UMTS, LTE & 5G
- Mobile Communications & Health (optional)
- Impotant procedures (registration, security, MTC)
- Whereabouts information and updates
- GSM, GPRS & EDGE radio interface
- UMTS radio interface: WCDMA
- HSDPA, HSUPA & HSPA+
- LTE & 5G radio interface: OFDMA
- Duplex & Multiplex
- Adaptive Modulation & Coding
- Cellular Internet of Things CIoT: NB-IoT & LTE-M
- Carrier Aggregation & Dual-Connectivity
- 5G Timing, Standardization & Key Aspects
- LTE & 5G Spectrum & Spectrum Auctions

Target Group

This course is aimed at anyone who needs a solid overview and understanding of current mobile technologies.

Prerequisites

Basics of telecommunications

This Course in the Web

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