



ویستا فن آوری فردا

مشاوره، اجرا، تامین و ارائه تجهیزات
آموزش دوره های تخصصی IT، مخابرات، مدیریت
شناسه ملی: ۱۴۰۰۷۲۹۶۴۲۹

GSM Technical Introduction for Engineer

- Introduction of telecommunication system targets
- Switching system introduction and compare between PS and CS technology
- Transmission system introduction and limitations
- Main concept of modulation and power measurement metric in dB

GSM System Overview

- Nodes and architecture of GSM

The GSM Radio Interface

- Time Division Multiple Access (TDMA)
- Time slots, physical and logical channels
- Radio related problems and solutions in GSM

- Signaling and Traffic multi frame structure

Cell Planning

- Cell types (macro, micro, pico)
- Coverage vs capacity
- General steps in the cell planning process

- Cellular Structure in GSM Network

Mobile Station and BSS (GERAN)

- Mobile Equipment (ME) and Subscriber Identity Module (SIM)
- Base Station System: BTS, BSC
- Mobile Station Block Diagram
- Mobile Station Processing Flow
- Mobile Station Operation Mode (Idle and Dedicated mode)
- Cell selection and Re-selection concept
- Handover concept and HO types

The Core Network

- Core Network nodes: MSC, GMSC, VLR and HLR



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Selected Traffic Cases

- Location Updating
- Call setup for roaming and non-roaming scenario
- Pre-paid and CAMEL
- SMS transfer

- Security in GSM Network

- Authentication
- Ciphering

- Radio Wave and Antenna

- GSM Services

- CRBT
- USSD
- MMS
- MCS
- OCS

GPRS System Overview

- Nodes and architecture of GPRS
- SGSN and GGSN

EDGE – Evolution towards higher bitrates

- 8QPSK modulation and new coding schemes
- Alignment of GPRS to UMTS

3G Technical Introduction for Engineer

- 3G System Standardization

- 3G Network features



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- 3G Network Release
- UMTS System Overview
- Nodes and architecture of UMTS
- UTRAN introduction
- UTRAN Interface
- RNC Functions
- Node B Functions

W-CDMA

- Basic WCDMA Concept
- UMTS – FDD Frequency band evolution
- Processing Gain
- Spreading and UMTS codes
- Code Tree Restrictions
- WCDMA Capacity Limitations
- Scrambling code planning

Bearers and Quality of Service

- The Bearer concept
- General QoS parameters

UTRAN Protocols and Channels

- Protocols: RRC, RLC, MAC, PHY
- Logical, Transport and Physical channels

Selected Traffic Cases

- Call setup (circuit switched)
- Web browsing (packet switched)
- Interoperability UMTS /GSM



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HSPA – High Speed Packet Access

- UTRAN evolution for higher bitrates

- UMTS power control
 - Open loop power control
 - Inner loop power control
 - Outer loop power control
 - Rake Receiver
- UMTS Handover
 - Soft and softer HO
 - Inter Technology HO (IRAT HO)
 - Inter Frequency HO
 - Admission control
 - Soft congestion control



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