

GSM System Survey



LZU 108 852 R10A

Description

Are you lost when discussing GSM network basic concepts? If you are starting working in different areas of GSM system and need a general concept this is the course you were looking for. It will provide you with knowledge about Ericsson's GSM based systems and GSM 800/900/1800/1900. It will focus on GSM terminology, wireless concepts, functions of network nodes, and the Ericsson implementation of those network nodes. Completing this training you will have all the initial knowledge you need to proceed in competence development in other areas.

Learning objectives

On completion of this course the participants will be able to:

- 1 Understand how mobile systems have evolved over the time and tell the history of GSM development**
 - 1.1 Recognize benefits of having a standard
 - 1.2 Describe the GSM geographical network structure and node functions
 - 1.3 Understand the GSM frequency bands
 - 1.4 List subscriber services provided in the GSM network

- 2 List Ericsson's GSM System divisions and components and perceive how Ericsson has been involved in GSM since its inception and took an active part in the GSM specification process**
 - 2.1 List network components and describe their functions
 - 2.2 Describe optional additional network entities functions
 - 2.3 Briefly present Protocols used in the GSM Access and Core Networks

- 3 Know basic concepts of wireless communications and its importance to provide a good knowledge of how GSM Systems works**
 - 3.1 Explain Time Division Multiple Access technique (TDMA)
 - 3.2 List the transmission problems and their solutions
 - 3.3 Understand how Adaptive Multi-Rate (AMR) can increase capacity

- 4 List and identify GSM System mandatory concepts of air interface, their functions and required specifications**
 - 4.1 Understand the concepts of physical channel and a logical channel
 - 4.2 List one important piece of information sent on each of 3 different logical channels
 - 4.3 Briefly explain the idea of mapping
 - 4.4 Show the time slot power saving feature

- 5 Differentiate the platforms that provide the network nodes and functionalities that are basis to provide Circuit and Packet switching, including AXE and CPP platform principles, list the main components and outline the main features**
 - 5.1 Understand the function of APT and APZ
 - 5.2 Differentiate functions that can be implemented using AXE platform modularity
 - 5.3 Explain how the group switch switches calls
 - 5.4 Discriminate the AXE 810 hardware structure
 - 5.5 Discriminate the CPP Hardware Platform
 - 5.6 Show CPP Interconnection Structure
 - 5.7 Clarify functions that can be implemented using CPP platform

- 6 Explain how Ericsson implements the functions and nodes of the GSM switching system**
 - 6.1 Name the nodes in the Switching System
 - 6.2 Know Ericsson's Mobile Softswitch Solution
 - 6.3 List which nodes that are contracted for the security procedure in the GSM system
 - 6.4 Briefly explain the purpose of Authentication, Ciphering and Equipment Check

- 7 List and identify Radio Access Network system nodes, its functions and required specifications**
 - 7.1 Outline the main functions of a BSC, TRC and RBS
 - 7.2 Describe the Abis over IP and Abis Optimization solution
 - 7.3 Briefly Explain A-Interface over IP
 - 7.4 List the Ericsson's RBS 2000 configurations
 - 7.5 Explain the RBS architecture and functional blocks
 - 7.6 Understand the benefits with new BSC BSS 08

- 8 Recognize different mobile stations types, including their components, functions, features and required specifications**
 - 8.1 Outline the information stored on the SIM-card.
 - 8.2 Explain the advantage of having a separation between mobile equipment (ME) and subscription (SIM-card).
 - 8.3 List the product categories of Mobile Stations (MS).

- 9 Clarify the GSM traffic cases to consolidate all the GSM Network concepts using basic traffic cases examples**
 - 9.1 Explain the purpose of GSM ID-number (MSISDN, IMSI, TMSI, MSRN and LAI)
 - 9.2 Understand the handover, locating and location updating concepts
 - 9.3 Briefly describe how a traffic case works



10 Explain the basic concepts and difficulties of planning a cellular network based on text examples and explanations

- 10.1 List the stages in the cell planning process
- 10.2 Explain the terms Grade of Service (GOS) and 'Erlang'
- 10.3 Name 2 types of Interference
- 10.4 Describe briefly the feature 'Re-Use of Frequencies within a Cell'
- 10.5 Understand what is meant by the term 'Hierarchical Cell Structure'
- 10.6 Describe briefly the feature 'BCCH in Overlaid Sub cell'

11 Recognize Ericsson's Operation and Support System – OSS as an important tool for operation and maintenance in GSM network describing its features and functions

- 11.1 Explain the functions of the Operations and Support System
- 11.2 Describe the architecture of the Operations and Support System
- 11.3 Outline the implementation of the Multi Mediation
- 11.4 Understand the implementation of the Ericsson Multi Activation

12 List the most common and main subscriber services, explaining their functions, features, and specifications

- 12.1 Define the different types of services available in the network
- 12.2 Indicate one of each of the following service types in the network: teleservices, bearer services and supplementary services
- 12.3 Identify one of the Ericsson innovative services in the network.
- 12.4 Briefly describe the mobile intelligent network services available with Ericsson GSM systems
- 12.5 Understand the need and advantages of the CAMEL system

13 Understand charging and accounting concepts

- 13.1 Identify their functions, features and required specifications
- 13.2 Explain the fact that the charging concept is changing due to the introduction of new technologies such as GPRS, UMTS
- 13.3 List three call components
- 13.4 Explain the future of billing

14 Discriminate how data calls are initiated in the GSM network and cite examples of how a data call is handled in a GSM network through a traffic case analysis

- 14.1 Explain the data transmission services which GSM offers
- 14.2 Describe a GSM data traffic case
- 14.3 List the data transmission services which GPRS offers
- 14.4 List the things that can lead to improved GPRS end-user performance
- 14.5 Describe a GPRS data traffic case



15 Have an overview of the possible future functionality of GSM-based systems.

- 15.1 Describe the evolution of GSM to WCDMA systems
- 15.2 List the technologies that will bridge these two systems including HSCSD, EDGE, GPRS, WCDMA and HSPA
- 15.3 Explain the 3G system and feature Adaptive Traffic Control

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

Prerequisites

The participants should be familiar with telecommunication basics.

Duration and class size

The length of the course is 4 days and the maximum number of participants is 16

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.