# GSM/EGPRS Signaling & Protocols on Um Interface

Course Number: GSM2300-01EN | Duration: 4 Days

## Target Audience

- MS & GERAN Development Staff
- Network Planning/ Performance Engineers
- Network Engineering and Optimisation Personnel

## Prerequisites

- GSM/EGPRS Air Interface (GSM2200-01EN)

## Learning Objectives

After completing this course, the students will be able to:

- Understand the call setup and release procedures for voice and packet.
- Analyse the various reasons for dropped calls in GSM.
- Identify the root causes for drops in EGPRS and be able to trace it on Gb-Interface.
- Decode downlink & uplink Ack/Nack packet and verify the correct block transmission.
- Determine the reasons for handover, handover failures and handover drops.

## Course Outline

1. Fundamentals of GSM & EGPRS
   - 1.1 Network Architecture – RAN & CN
   - 1.2 GSM/EGRPS Feature Overview
   - 1.3 CS/PS RRC & (G)MM States
   - 1.4 Protocol Architecture Phase1 – R9
2. General Signalling Procedures
   - 2.1 MS & RAN/CN Identifiers
   - 2.2 SIM/USIM Functionality
   - 2.3 System Information Broadcasting
   - 2.4 Service Area Broadcasting - CBS
   - 2.5 CS/PS Paging – Paging Coordination
   - 2.6 Idle Channel Supervision
3. Registration (MM/GMM)
   - 3.1 PLMN & Cell Search
   - 3.2 Location Update & GPRS Attach
   - 3.3 Combined Attach for PS & CS
   - 3.4 Location & Routing Area Update
   - 3.5 CS/PS Detach Scenarios
4. RR (Re-)Establishment
   - 4.1 Random Access Procedure
   - 4.2 SDCCH & TCH Seizure
   - 4.3 Layer 1-3 Drop Reasons
   - 4.4 Call Re-establishment
5. TBF Establishment Methods - Rel. 9
   - 5.1 UL TBF Establishment (Standby & Ready State)
   - 5.2 DL TBF Establishment (Standby & Ready State)
   - 5.3 Concurrent TBF Establishment
   - 5.4 Normal/Abnormal TBF Release
   - 5.5 BSSGP Radio Status Signalling Cases
   - 5.6 PDCH Release & Reconfiguration
6. Call Setup Procedures
   - 6.1 Successful AMR/FR MOC
   - 6.2 Successful AMR/HR MTC
   - 6.3 Unsuccessful TCH Assignments
   - 6.4 Normal / Abnormal Call Release
7. Handover Procedures
   - 7.1 Emergency Intra-Cell HO
   - 7.2 Intra-Cell SDCCH HO
   - 7.3 Successful Intra-BSC HO
   - 7.4 Unsuccessful Intra-BSC HO
   - 7.5 Successful Inter-BSC HO
   - 7.6 Unsuccessful Inter-BSC HO
8. Other CS related Procedures
   - 8.1 Power Control & Timing Advance
   - 8.2 Inter-RAT HO (2G ➔ 3G)
   - 8.3 Queuing & Preemption
   - 8.4 Directed Retry HO
   - 8.5 Traffic Reason HO
   - 8.6 USSD & Supplementary Services
9. EGPRS Mobility Scenarios
   - 9.1 NC0 – MS autonomous Cell Change
   - 9.2 NC2 – PCU controlled Cell Change
   - 9.3 NACC – with NC0 and NC2
   - 9.4 Inter-RAT Change (2G ➔ 3G/4G)
10. DTM Procedures
    - 10.1 GTTP Scenarios
    - 10.2 CS Call with TBF Establishment
    - 10.3 Ongoing TBF with incoming CS Call
    - 10.4 DTM Release