

GSM, UMTS and LTE: Fundamentals and RF Measurements on Mobile Station

Lyon (France)

4 - 8 January 2027

UK Training

PARTNER



GSM, UMTS and LTE: Fundamentals and RF Measurements on Mobile Station

Code: GC32 From: 4 - 8 January 2027 City: Lyon (France) Fees: 5900 Pound

Introduction

The evolution of mobile communication networks from GSM to UMTS and later LTE marks a significant leap in wireless technologies. This progression not only reshaped the user experience but also introduced a technically complex environment that requires a solid understanding of network fundamentals, spectrum management, and RF measurements at the mobile station level.

This program is designed to provide participants with a comprehensive view of these technologies and practical skills in performing RF measurements on mobile devices using specialized tools. The target audience includes executives, decision-makers, and professionals seeking deeper insights into modern mobile networks and their applications across various industries such as telecommunications, oil and gas, financial services, and government institutions.

The practical value of this course lies in equipping participants with the ability to interpret measurement results, improve service quality, and ensure network efficiency under growing operational challenges.

Course Objectives

By the end of this course, participants will be able to:

- Understand the fundamental concepts of GSM, UMTS, and LTE networks.
- Explore the architecture and core components of each technology.
- Perform RF measurements on mobile stations with professional tools.
- Analyze and interpret field measurement data effectively.
- Apply specialized software for service quality optimization.
- Compare the performance of different technologies using KPIs.
- Address common challenges encountered in field testing.
- Link measurement outcomes to real-world network performance.

Course Outlines

Day 1: Fundamentals of GSM Networks

- Introduction to the evolution of mobile communications.
- GSM network architecture overview.
- Mobile Station MS components and functions.
- Frequency allocation and spectrum basics in GSM.
- GSM services voice, SMS, data.
- Quality of Service QoS parameters in GSM.

Day 2: UMTS Technologies and WCDMA Architecture



- Transition from GSM to UMTS: key drivers.
- UMTS network architecture explained.
- WCDMA technology and multiple access principles.
- Spectrum management in UMTS.
- High-Speed Packet Access HSPA in UMTS.
- Performance indicators for UMTS networks.

Day 3: LTE and the Shift to 4G

- Introduction to LTE and its development goals.
- LTE network architecture and main elements.
- OFDMA and SC-FDMA technologies in LTE.
- LTE frequency channels and bandwidth considerations.
- QoS testing in LTE networks.
- LTE KPIs and their role in performance evaluation.

Day 4: RF Measurements and Field Testing

- Introduction to RF measurement concepts.
- Tools and equipment for mobile station measurements.
- Types of RF tests: coverage, interference, signal quality.
- Result analysis and interpretation with specialized software.
- Role of Drive Testing in Network Optimization.
- Practical case studies of RF measurement scenarios.

Day 5: Practical Applications and Result Analysis

- Hands-on RF measurement for GSM.
- Hands-on RF measurement for UMTS.
- Hands-on RF measurement for LTE.
- Comparative analysis of GSM, UMTS, and LTE results.
- Developing network improvement recommendations.
- Review of real-world case studies.

Why Attend this Course? Wins & Losses!

- Gain an in-depth understanding of modern mobile communication systems.
- Learn to conduct professional RF measurements.
- Strengthen analytical skills for interpreting field data.
- Apply practical knowledge with real-world testing tools.
- Bridge theoretical knowledge with field applications.
- Improve strategic decision-making in network optimization.
- Acquire practical insights into field challenges and their solutions.
- Learn global best practices in RF testing and performance management.

Conclusion

Mastering the fundamentals of GSM, UMTS, and LTE and learning how to perform RF measurements on mobile stations is essential for professionals aiming to enhance network efficiency and service quality. This program

PARTNER





provides participants with an integrated approach, combining theoretical insights, hands-on fieldwork, and practical data interpretation.

By addressing real-world challenges and equipping participants with advanced tools, the course enables organizations across diverse industries to maintain high-performing networks and deliver superior communication services.

Head Office: +44 7480 775 526
Email: Sales@blackbird-training.com
Website: www.blackbird-training.com



Blackbird Training Clients



MANNAI Trading
Company WLL,
Qatar



Alumina Corporation
Guinea



Booking.com
Netherlands



Oxfam GB International
Organization,
Yemen



Capital Markets
Authority,
Kuwait



Waltersmith Petroman Oil Limited
Nigeria



Qatar National Bank
(QNB),
Qatar



Qatar Foundation,
Qatar



AFRICAN UNION ADVISORY
BOARD ON CORRUPTION,
Tanzania



KFAS
Kuwait



Reserve Bank of
Malawi,
Malawi



Central Bank of Nigeria
Nigeria



Ministry of Interior
Kingdom of Saudi Arabia
KSA



Mabruk Oil Company
Libya



Saudi Electricity
Company,
KSA



BADAN PENGELOLA
KEUANGAN Haji,
Indonesia



NATO
Italy



ENI CORPORATE
UNIVERSITY,
Italy



Gulf Bank
Kuwait



General Organization for
Social Insurance
KSA



Defence Space Administration
Nigeria



National Industries
Group (Holding),
Kuwait



Hamad Medical
Corporation,
Qatar



USAID
Pakistan



STC Solutions,
KSA



North Oil company,



EKO Electricity



Oman Broadband



UNITED NATIONS
UN.



Authority for

UK Training
PARTNER



Blackbird Training Categories

Management & Admin

Entertainment & Leisure
Professional Skills
Finance, Accounting, Budgeting
Media & Public Relations
Project Management
Human Resources
Audit & Quality Assurance
Marketing, Sales, Customer Service
Secretary & Admin
Supply Chain & Logistics
Management & Leadership
Agile and Elevation

Technical Courses

Artificial Intelligence (AI)
Sustainability, ESG & Corporate Responsibility
Advanced Courses
Hospital Management
Public Sector
Special Workshops
Oil & Gas Engineering
Telecom Engineering
IT & IT Engineering
Health & Safety
Law and Contract Management
Customs & Safety
Aviation
C-Suite Training

