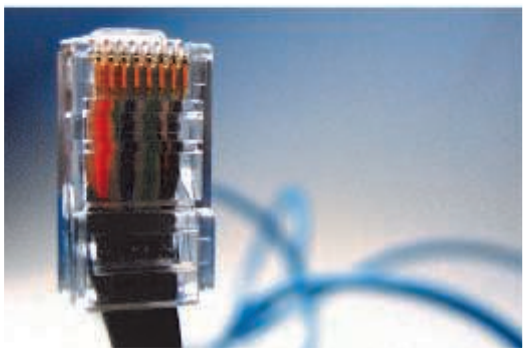
Telecoms Academy

TRAINING EXCELLENCE

PACE Enabled Training

LTE Technology



Format: Classroom or Interactive Online Delivery

Duration: 2 days or 4 x 3 Hour Online Sessions

Course Highlights

- Comprehensive overview of LTE
- Suitable for those who need to understand the realities of LTE technology and its implications for the business
- LTE technology concepts made accessible with easy explanations - covering the radio as well as the evolved radio access and packet core networks
- LTE Advanced presented as well associated systems and technologies
- Latest industry research and analysis of LTE deployments and strategies
- Classroom or Web Based Delivery

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Course Description

The delegate attending this course will gain a comprehensive appreciation of the architecture and operation of the LTE system including the OFDM based radio interface.

Firstly, a comprehensive helicopter view of LTE is presented in order to provide context for the topics covered as the course progresses. The capabilities and limitation of LTE are examined as well as the overall business implications of LTE deployment (in the light of the evolution of mobile broadband).

The radio interface is based on OFDMA and supports advanced features such as MIMO and interference management. These concepts are explained, as well as related topics such as spectrum usage and deployment. The architecture of release 8 LTE network (SAE) is explained and the functions of each network node, MME S-GW, P-GW, eNB and interfaces X2 and S1 are discussed. The Evolved Packet Core (EPC) concepts and implementation issues are developed to ensure a comprehensive understanding of basic operation, roaming and interworking with 3GPP and non-3GPP systems.

LTE service provision, including voice options and VoLTE, is discussed and used to tie together the capabilities and procedures required of both the radio and core network components. Throughout, typical procedures are used to consolidate overall understanding of LTE.

Learning with PACE

PACE Enabled Training

The key to effective learning is how the competencies (knowledge, skills and confidence) are developed, and in particular, how they are **applied** both within the training and then more importantly in the work place. Our programmes are designed around this belief using the principle of PACE – Preparation, Application, Consolidation, Experience. For this course, specific PACE features include:

Preparation

- Pre course learning module (optional)
- Online Webinars (optional)
  - LTE Introduction
  - LTE Industry Update
  - Access Networks and Core Networks
- Pre-course quiz (for your eyes only)

Application

- Current industry analysis from Informa Telecoms and Media analysts
- Real and practical examples used throughout the course
- In-depth overviews of the radio interface, network architecture, network nodes and network protocols.
- A look at voice over LTE using IMS

Consolidation

- Additional Telecoms Virtual Campus tutorials
- On-going Technology Analysis and white papers
- Post course tutor support
- Post course networking and interaction via our linked-in groups

Experience / Engagement

- Highly interactive delivery style
- Very experienced trainer / LTE expert
- Class dynamics moulded to facilitate maximum learning opportunity
- Detailed course material, useful for post-course reading
- Comprehensive LTE Glossary included with course material

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Outcomes and Competency Development

The participant will:

- Gain a comprehensive understanding of LTE technology and LTE network operations and the impact that LTE deployments have on the operator
- Gain an insight into the OFDMA radio interface, understand its basic operation, benefits and limitations.
- Analyse the network architecture, the functions of the network nodes, the protocol s and operation of the system interfaces.
- Determine best strategic approach for LTE implementation , taking in to account existing mobile broadband technologies and spectrum issues.
- Focus on the capabilities and requirements of LTE in respect of service delivery.
- Appreciate the different options for voice support in LTE, including CS-Fallback and VoLTE.
- Gain a thorough “big picture” understanding of all elements of LTE and SAE/EPC
- Gain access to the latest research from Informa Telecoms and Media analysts regarding the current status of the LTE market and current deployments.
- Build confidence to make decisions on technology implementation and procurement that are commercially viable, minimise risk, and in line with the strategy and goals of the wider organization.

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Course Content

LTE Overview
LTE Features and Performance
LTE Architecture
LTE Radio Interface
MIMO
LTE Services and Voice
Spectrum for LTE
Deployment Benefits of LTE
Cost Factors

The Need for LTE & Market Dynamics
Global Mobile Broadband Market Trends
- Subscriptions
- User Trends
- Technologies
- Challenges

The Role of LTE
- Drivers & Growth
- Positioning & Success Criteria
- Commitments

Factors Influencing Revenues
- ARPU Forecasts
- Service Revenues
- Roaming

How the Industry Sees LTE – Informa Surveys
- Rationale
- Timing
- Services & Apps
- Differentiation & Pricing

LTE Radio Interface
Key Concepts & Performance
Multiple Access in LTE –
- OFDMA and SC-FDMA

Organising the Information –
- Channels, Frames and Physical Mapping

Performance Improvement
- MIMO and Advanced Antenna Techniques

Summary

Service Architecture Evolution (and the Evolved Packet Core)
Introduction to SAE and the EPC
LTE terminology
Evolution to 3GPP Release 10
The need for an IMS
eNB interfaces to the EPC
Objectives and advantages of the EPS
EPC architecture and interfaces
Architecture functionality
EPS bearers and bearer types
QoS mechanisms
S1-flex and pool areas
Interworking mechanisms
SAE Security

Service Provision in LTE
LTE Voice Service Options
Circuit Switched Fall Back (CSFB)
VoLTE (Voice over LTE)
Billing and Charging Mechanisms
Online and Offline Charging
PCC (Policy Control & Charging)
Non-Voice Services and Applications

4G – LTE Advanced and Beyond
Evolution to 4G
IMT and 4G
4G Technologies
LTE Advanced
4G Services, Applications and Devices

Annex: LTE Deployment
Evolutionary Paths to LTE and LTE Advanced
Radio Planning Issues
Spectrum Usage
Interference
Conformance

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Delivery Options

We can customise your company-specific programme to incorporate or focus on a range of LTE topic areas. Throughout the process you will be guided by our experienced training developers, who will ensure that we produce and deliver a course that exactly matches your needs. We would be happy to tailor the programme to use a number of delivery options:

- **Public Scheduled Training** – Join the many public programmes around the world, as a standalone course or alongside an Informa conference
- **Company-Specific Training** - Take a course off the shelf or work with us to produce a customised programme to meet the exact needs of your business and employees.
- **Distance Learning** – Study at your own pace with our range of fully supported distance learning programmes
- **Virtual Classroom** – Get the benefits of high quality, interactive instructor led training online without the associated travel costs
- **Blended Training** — Gives you the freedom to build programmes that are engaging, interactive and keep participants motivated and progressing

Our Faculty Structure

Our training programmes are delivered worldwide as part of the training and development plans of many large operators, vendors, and service providers.

To ensure we fully meet the training needs of the industry, we have split our portfolio into specific faculties that reflect the required competencies:

- **School of Telecoms Management** – Management an Business training tailored to the telecoms industry and ranging from the intensive 5-day Telecoms Mini MBA programme to specialist leadership and marketing training.
- **School of Advanced Communication Technologies** – Covering a wide range of technologies, these courses range from overviews to in-depth engineering training.
- **Distance Leaning** – Our comprehensive suite of Distance Learning programmes provide an excellent opportunity to expand your knowledge.

Other Courses to Consider

The School of LTE & Advanced Communications, www.schooloflte.com, includes:

- LTE Foundation Courses
- LTE Technical Overviews
- Air Interface
- eUTRAN; Architecture & Protocols
- LTE Radio Planning and Optimisation
- Backhaul for LTE and HSPA
- Backhaul planning
- Supporting technologies, including MPLS
- VoLTE & IMS for LTE
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We also offer Diploma in LTE and Advanced Communications. Please contact us for details.

University Accreditation

Some of our Informa programmes have been accredited by, and are offered in partnership with the University of Derby Corporate; a UK-based university highly acclaimed in the area of employer engagement. They are at the forefront of the drive to integrate highly focused industry-led training with the academic rigor and quality control of university-based education.

Our comprehensive Advanced Telecoms Management Series (ATMS) have been accredited at Level 7 (Post-Graduate), with our extensive suite of Distance Learning at Level 4 (Undergraduate Level).

Although accreditation is specific to these programmes, the work we do with the University of Derby enable us to develop and apply best practice across our portfolio.

Further Details

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