

Telecoms & Tech
Academy

DIPLOMA IN LTE & 5G

Gain a thorough grounding in
LTE and 5G and the many
supporting technologies

www.telecomstechacademy.com/course/diploma-in-lte-5g

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ABOUT THIS COURSE

The Diploma in LTE & 5G is a 10-month distance learning programme providing participants with highly detailed technical and business competencies surrounding LTE & 5G. The course focuses on current and future technologies, services, management techniques, digital transformation and protocol. Participants study 4 compulsory modules and choose 5 specialised modules, allowing them to customise the course towards areas of interest.

Who will benefit?

This would suit anyone in the telecommunications industry who requires a detailed understanding of the LTE & 5G concepts, the challenges in its deployment and an insight into the current market position. The programme is designed to give you a detailed understanding of LTE & 5G, and through its' modular structure allows for a good degree of specialisation and allows you to tailor your programme to suit you and your organisation's needs.

The programme format

The modular structure allows you to customise the programme to support your aspirations and to fulfil your individual and organisational requirements, you study an introductory module, four core modules, followed by five elective modules.

Each module is designed to be studied over a period of a month and requires 20 hours of direct learning. Comprehensive courseware comprise written modules, self-test exercises, video tutorials, Live on Web tutor support, topic-specific webinars, supporting material, best practice discussion groups, and comprehensive learning packs.

Assessment is on-line and can be done in your place of work or study, subject to invigilation, and requires both short/multiple choice answers as well as longer written essay submissions.

WHAT SETS THIS PROGRAMME APART?



The courses are examined and qualified by the biggest global provider of research, intelligence, events and training to the telecoms industry.



Through our mix of learning delivery methods and support, we keep you fully engaged to ensure you meet the required standard.



Flexible modular course structure allows you to study subjects most relevant to you and your business



Regular webinars are provided, covering the latest technologies, business processes and industry developments



You decide where and when to study and then set your own pace.



You will have full tutor support from a dedicated tutor with a wealth of industry experience

COURSE SUMMARY

Students complete 9 Modules

Core Modules (4 Modules)	Specialist Modules (Select 5)
<p>C1 Introduction to LTE and 4G Wireless</p> <p>C2 The LTE Air Interface</p> <p>C3 The LTE Core Network (Evolved Packet Core)</p> <p>C4 Towards 5G - Markets & Technologies</p>	<p>E1 LTE Radio Network Planning</p> <p>E2 Maximising Performance and Efficiency</p> <p>E3 Managing Services, PPC and Billing</p> <p>E4 Traffic Engineering, QoS and MPLS in IP Networks</p> <p>E5 Operating Effectively in Telecoms</p> <p>E6 Marketing Telecoms and Digital Services</p> <p>E7 Technology Transformation</p> <p>E8 Project Management in Telecoms</p> <p>E9 Connected TV – Internet Protocol for Television</p> <p>E10 Finance for Telecoms Professionals</p>

ENHANCED LEARNING SOLUTIONS

Managed Learning System

Offers convenient and flexible access to resources such as course material, frequently asked questions, practice examinations and tutor support.

Fully Illustrated Courseware

Soft copy course notes, data and analysis from the Ovum research team, practical exercises and self-assessment tests in preparation for exams.

Tutorials

Regular informal tutorials to discuss the programme, ideas and progress, they give a chance to meet with tutors and other students online.

Diploma in LTE & 5G

Video Lessons

Informative videos used to outline key study points and to set the context for study and consolidate ideas, maximising learning and engagement.

Live Webinars

Enhance your learning with live webinars, bringing the latest technologies and business management topics that

SYLLABUS - Core Modules

C1 - Introduction to LTE & 4G Wireless

- The Wireless Evolution Roadmap
- Global Market Analysis
- Market Trends
- 3G and 3.5G Wireless Systems
- 3GPP Evolution
- The LTE/SAE Concept and Requirements
- 3GPP2 Evolution and Future Options
- The IEEE 802.16 Family
- Technologies for Evolving Wireless
- The ITU 4G Framework and Timelines
- Candidate 4G Technologies
- Services, Applications and Timelines

C2 - The LTE Air Interface

- Overview of the 3GPP Architecture
- LTE Protocol Stack Overview
- Performance Requirements
- The Physical Layer
- LTE Layer 2
- The Packet Data Protocol (PDCP)
- PDCP Messages and Procedures
- Mobility Procedures
- Multicast Architecture for LTE
- LTE-Advanced
- LTE-Advanced (LTE-A)

C3 - The LTE Core Network (Evolved Packet Core)

- Introduction to SAE/EPC
- Core Network Evolution
- Migration Paths, Data and Voice
- EPC Architecture and Interfaces
- Interworking with Legacy Networks and non-3GPP Networks
- LTE Areas and Identities
- The EPS Bearer
- Quality of Service (QoS)
- Charging Mechanisms
- Protocols Used in the EPC
- SAE Security
- EPC Procedures

C4 - Towards 5G - Markets & Technologies

- Defining 5G
- 5G market drivers
- From LTE to 5G
- Steps towards 5G
- 5G value creation
- 5G use cases
- Connected verticals for 5G
- 5G technologies
- Requirements for 5G networks
- 5G network concepts
- 5G radio access networks and technologies
- 5G interworking
- Software Defined Networking (SDN) and Network Functions Virtualisation (NFV)
- Network slicing
- Mobile Edge Computing (MEC) Distributed vs centralised RAN

*"I was really enlightened.
I liked how different
topics were introduced
and then developed..."*



SYLLABUS - Specialist Modules (select 5)

E1 - LTE Radio Network Planning

- Review of Wireless Principles and Propagation
- RF Principles
- Parameters and Measurements
- Modulation and Coding
- Propagation
- Impairments
- OFDM and OFDMA Principles
- OFDM Parameters
- The LTE Air Interface
- Antenna Systems
- Multi-Antenna Configurations
- Link Budgeting
- Propagation Models
- Model Selection
- Model Inputs
- Tuning Propagation Models
- Capacity Planning for LTE
- Coverage v Capacity
- Traffic Profiling

E2 - Maximising Performance and Efficiency

- Network Optimisation
- LTE Advanced
- Small Cells and HetNets
- EXERCISES: Including hands-on optimisation experience using the Mentum Planet planning tool from InfoVista

E3 - Managing services, PCC and Billing

- Billing Principles
- Online Charging
- Offline Charging
- Next-Generation Billing
- Billing for IMS Services
- Policy Control and Charging (PCC)
- PCC Architecture and Procedures
- Maximising OSS and BSS Potential
- Billing for Roaming Services
- Revenue Assurance

E4 - Traffic Engineering, QoS and MPLS in IP Networks

- Principles of QoS
- QoS Options for IP Networks
- Class-based QoS
- The LTE QoS Framework
- Principles of Traffic Engineering
- Introduction to MPLS
- MPLS Architecture
- Label Distribution in an MPLS Network
- The Label Distribution Protocol
- Distribution Procedures
- Label Switch Router Operation
- MPLS Management
- Traffic Engineering
- Generalised MPLS (GMPLS)
- MPLS Security
- MPLS with Frame Relay and ATM

E5 - Operating Effectively

- The Business Environment
- The Operational Environment
- The Basic Requirements – Operational and Administrative
- Internal Organisation
- Major Divisions and Responsibilities
- Key Functions
- Interrelationships
- Processes and Procedure Flows
- Marketing and Sales
- Provisioning
- Engineering Processes
- Fault Reporting and Rectification
- Billing and Charging
- Customer Care Facilities
- Business Systems
- Operational Systems
- Operations and Maintenance
- The Role and Scope of OSS and BSS
- The TMF and eTOM
- Current and Legacy OSS/BSS Systems
- Topologies and Infrastructure
- Customer Care and OSS
- NGOSS Explained

SYLLABUS - Specialist Modules (select 5)

E6 - Marketing Telecoms and Digital Services

- Marketing converged communication services
- Customer satisfaction and loyalty drivers
- Communications marketing objectives and metrics
- Elements of the marketing strategy
- Segment-specific marketing
- Configuring customer solutions
- Pricing and bundling next-generation services
- Distributing next-generation services
- Promoting communications solutions
- The role of telecoms and third-party brands

E7 - Technology Transformation: Virtualisation, Cloud and Convergence

- Convergence as a Concept
- Convergence Technologies
- Convergence and Bundling
- Cloud Concepts
- SaaS, PaaS, IaaS (Software, Platform, Infrastructure...as a Service)
- The Cloud Architecture
- Virtualisation – Advantages
- Software Defined Networks
- Network Function Virtualisation
- The NFV Platform
- The Evolved Packet Core – Bringing it all Together

E8 - Managing services, PCC and Billing

- Essentials of building a credible project plan
- Financial resourcing and planning
- Project management planning cycle
- Risk analysis and treatment in project management
- Effectively understand and apply project management tools

E9 - Connected TV - Internet Protocol for Television Transmission

- Digital TV Technologies
- Digital Broadcasting Standards
- Digital Processes
- Mobile Video
- IP Video
- Internet Video
- Digital Rights Management (DRM)
- Developing Video Technologies
- Case Studies

E10 - Finance for Telecoms Professionals

- Excellent grounding in financial matters
- Analyse and apply financial concepts
- Principal financial documents (P&L, Balance Sheet & Cash Flow)
- Key financial ratios
- Cash flow forecasts

“The program was well structured and the instructional method was excellent...”



CABLE & WIRELESS

Telecoms & Tech Academy is a leading training partner to the telecoms, media and technology (TMT) industries, having trained more than 30,000 professionals and 500 businesses globally.

We were borne out of the telecoms industry and understand the challenges the sector has been facing. Our training portfolio continues to evolve to help address new and emerging skills gaps faced by telecoms & tech businesses. To provide you with leading-edge knowledge, our learning is influenced by our partners including Ovum and Google.

What competencies are you looking to build in your teams? Here's a snapshot of where we can help:

Building Technical Skills:

- Big Data, Analytics & Artificial Intelligence
- Network Virtualisation (NFV & SDN)
- 5G Network Technology
- Emerging Services Including: Internet of Things, Smart Cities & Connected Innovation

Telecoms & Leadership:

- Our flagship Telecoms Mini MBA has trained over 15,000+ professionals
- Innovation & Digital Transformation
- Customer Focus



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