Telecoms & Tech Academy

COURSE DESCRIPTION
MOBILE NETWORKS EXPLAINED

Format:
Classroom

Duration:
2 Days

KNect 365
Learning

an informa business

COURSE SUMMARY

HIGHLIGHTS

- **Highly focused and in-depth training from the experts - including relevant updates from Informa's extensive research team**

- **Trainers and programme directors that are experts, industry experienced, and highly accomplished training professionals**

- **Training outcomes and competency development designed to meet your specific requirements.**

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"Excellent presenters, very professional and experts in their fields

FA, MTN

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COURSE SUMMARY

Designed to give a comprehensive and clear understanding of mobile network technology and operations, this course examines a modern mobile telecommunications network end to end. All aspects are covered including services and applications, transmission and switching technologies, control, signalling and networking, as well as mobile network operation and techniques. Exercises and discussions are used throughout to build the model of a typical network and operator strategies.

Focussing mainly on the 3GPP family of technologies, the delegate will gain a unique insight into the evolving architecture of modern networks. The on-going evolution through GPRS and EDGE to 3G (W-CDMA and UMTS), HSPA and LTE is discussed, together with the impact on current network infrastructure. The infrastructure required to provide fast internet access, as well as value added services such as messaging, voicemail, and location services is discussed, alongside billing issues, prepaid, roaming and planning processes.

The importance of Operational Support Systems, Business Support Systems and Network Management are described, reflecting the need to support the increasingly complex network and service offerings. An assessment of the mobile market place is used to describe trends and potential growth areas over the coming months and years. Finally, the impact of other technologies such as WiMAX and WiFi are discussed and evaluated in order to complete the picture.

OUTCOMES & COMPETENCY DEVELOPMENT

You will develop or be able to:

- Describe the main principles and requirements of modern cellular networks, differentiating between circuit-switched and packet-switched requirements

- Identify the main differences between various radio systems, focusing on GSM, GPRS, EDGE, 3G W-CDMA (UMTS), HSPA, and LTE

- Describe the basic architecture of a cellular system, and the functionality of network elements

- Follow basic service procedural diagrams, describing the operation of various network elements for circuit-switched call control scenarios and also access to content and the Internet

- Describe the operation of Roaming, Billing (including Prepaid), IN / CAMEL Services and Location-Based Services

- Recognise the technologies that provide the building blocks for the overall mobile network in terms of Transmission, Switching, Signalling and Control, and Networking. Differentiate between technologies used in the access network a & those used in the core

- Name three functions supported by each of OSS, BSS and Network Management within modern networks, showing the relative position within the architecture

- Understand how other radio access technologies such as WiMAX and WiFi can be used to enhanced the user experience

- Understand the role that the Internet & IP services are playing in modern networks and how it is developing in terms of systems, architecture, & procedures

COURSE CONTENTS

INTRODUCING MOBILE NETWORKS

- A Telecommunications Network
- Components of a Cellular Network
- Cellular Networks
- Drivers for mobility
- The requirements of a Mobile Telecoms network
- The market place
- Trends and Forecasts
- Regulation and Standards
- GSM family – The Global Standard
- 3G and beyond

RADIO AND CELLULAR PRINCIPLES

- What is a cellular system?
- Radio characteristics
  - Analogue vs Digital
- Spectrum – a scarce resource
  - The value of spectrum
  - Sharing the resource – multiple access techniques
- Maintaining the call whilst mobile
  - Handover
- Planning the network
- Technical
- Costs
- The roll-out

THE USER EXPERIENCE (SERVICES, APPLICATIONS AND HANDSETS)

- Services
  - Categories
  - The service mix
  - Provision of Services
- Paying for services
  - Example services
  - Messaging
  - Multimedia information
- Value Added Services (VAS)
  - Providing Content
- WAP, XHTML, i-Mode

- Accessing the services
  - A Virtual Home Environment?
- User Devices
  - The user interface
  - Design considerations
- Complimentary technologies
  - Bluetooth
  - Wireless LAN (WiFi)
- Current Handsets and capabilities
- Exercise – an Island Telco (Choosing the strategy and access scheme)

THE GSM AND GPRS NETWORK INFRASTRUCTURE

- The network – the basics
  - Circuit or packet switched?
- The Core Network
  - Switches and routers
  - Circuit Switched
  - Packet Switched
- Signalling – SS7
- Controlling the network
  - Mobility
  - HLR, VLR, EIR and AuC
  - Services – IN and CAMEL
- The Radio Network
  - Radio Elements
  - Base Transceiver Station (BTS)
  - Base Station Controller (BSC)
- Evolution to 3G and beyond
  - The Evolving Core Network
  - EDGE
  - UMTS and W-CDMA
  - HSPA/HSPA+
  - LTE
- IP Network Infrastructure
- IP Multimedia Subsystem (IMS)
- Convergence and the evolving network
- Exercise – an Island Telco (Designing the Network)

COURSE CONTENTS

PROCEDURES AND OPERATION

- Identities
- Location and Routing Areas
- Procedures
- At switch-on
- Finding the network
- The Location update
- Making & receiving a call
- Supplementary service examples
- RA Update
- Establishing the IP session (for access to the Internet, to a corporate intranet, or to content)

NETWORK BUILDING BLOCKS

- Transmission - Connecting the network together
- Use of Radio (including microwave links), Copper, and Fibre
- PDH (E1 Links), SDH, DWDM and Leased Lines
- Transport and switching technologies
- IP, ATM, Frame Relay
- Signalling and Control
- Mobile Signalling, SS7
- Operations and maintenance
- Exercise – an Island Telco (Building the infrastructure)

SUPPORTING SYSTEMS

- Messaging Systems
  - SMS
  - MMS
  - Voicemail
- Location Based Services
- Content Systems
- IN and CAMEL
  - Prepaid systems
- Open Service Access
- The Operational Support System (OSS) and Business Support System (BSS)
- Billing Systems in the Mobile Environment
- Exercise – an Island Telco (Operating Profitably)

BRINGING IT ALL TOGETHER:

- Reviewing the operator / network model, including:
- Infrastructure
  - Architecture, Vendors
- Branding
- Services and Applications - Strategies
- Data access mechanisms
  - Circuit switched, GPRS
- Content
  - Portals & Content types
- Evolution Strategies
- (The final session is used to review the exercises and discussions and build on previous sections)

OUR TRAINING SERVICES

TELECOMS & TECH ACADEMY STRUCTURE

Our training programmes are delivered worldwide as part of the training and development plans of many operators, vendors, and service providers. The programmes cover a wide range of competency development requirements.

To ensure we meet the training needs of the industry as effectively as possible, we operate three schools:

School of Telecoms Management
Business training tailored to the telecoms industry, ranging from the intensive 5-day Telecoms Mini MBA to specialist leadership and marketing training.

School of Advanced Communication Technologies
Covering a multitude of technologies, these courses range from overviews aimed at nontechnical staff to in-depth engineering training.

Distance Leaning
Our comprehensive suite of Distance Learning programmes provide an excellent opportunity to expand knowledge and build confidence.

OUR TRAINERS

We only use trainers and programme directors that satisfy the following three criteria:

- Experts in their field
- High level of Industry Experience
- Expert facilitators and training professionals

All our trainers have undergone a rigorous election process and are subject to continuous monitoring and evaluation. Each trainer is accredited for specific courses or topic areas. Whether engineers or business experts, all our trainers are required to continue their own development within their specialist areas, and to broaden their Industry view of trends, best practice and technology.
This is achieved by our on-going work with many tier 1 operators and vendors, and by full exposure to Ovum research and KNect 365 TMT worldwide events.

UNIVERSITY ACCREDITATION

Some of our programmes have been accredited by 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 have been accredited Post-Graduate Level, with our extensive suite of Distance Learning at Undergraduate Level)

We would be happy to discuss extending accreditation to tailored ATMS or programmes based on our Distance Learning modules. Although accreditation is specific to these programmes, the work we do with the University of Derby enable us to apply best practice across our portfolio.

CUSTOMISED IN-HOUSE TRAINING

Telecoms & Tech Academy has worked with countless companies to deliver customised training programmes. We take time to understand your requirements, you'll work with our specialist training team to ensure that we deliver your perfect training programme for your business.

A customised training programme from Telecoms & Tech Academy ensures you get a course that precisely matches your organisation's needs, presented by a first-rate training organisation, with access to all the latest industry research and analysis.

WHY CHOOSE IN-HOUSE TRAINING FROM TELECOMS & TECH ACADEMY?

- Content can be customised to focus on the issues you want – work with us to develop the training course to match the exact needs.
- Unique industry research – from Ovum's team of industry leading analysts
- Expert trainers – our team of versatile trainers have the knowledge and experience to deliver a highly effective learning experience
- The most efficient way to train your staff – at the time and location to minimise disruption
- Flexible delivery options – with a range of instructor led, distance learning and virtual classroom formats available you can build a blended solution to maximise training effectiveness over the long term
- Pre and post course assessment – can be included in programmes to measure competencies and check on the required progress.

Contact us to discuss how we can build your perfect programme.

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