

Telecoms & Tech Academy

SCHOOL OF ADVANCED
COMMUNICATIONS
TECHNOLOGIES

COURSE DESCRIPTION **INTELLIGENT NETWORKS & CAMEL**

Format:
Classroom

Duration:
5 Days

**KNect365
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 industry and organisational requirements**



“The course was very insightful and the lessons learnt from the course will be very relevant to the telecoms industry

BL ETISALAT

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COURSE SUMMARY

This course explains the role that the IN (Intelligent Network) concept and CAMEL (Customised Applications for Mobile Networks Enhanced Logic) play in providing effective control of services and features in modern telecommunication networks.

Potential services and applications are discussed and used to illustrate the value that both IN and CAMEL can bring to both operators and users. Specifically, the role and operation of CAMEL in mobile Prepaid solutions is explained and discussed in detail.

A clear explanation is given of the Intelligent Network Application Part (INAP), Mobile Application Part (MAP), and CAMEL Application Part (CAP) of SS7 and how they interact with Call Control Protocols (ISDN User Part - ISUP) to provide control of the overall service. Examples are used throughout to illustrate different call and service scenarios.

We look at the concept of the Intelligent Network, together with its basic features and services, and the role of SS7. Later, an overview of the relevant 3GPP procedures is given (required in order to understand CAMEL operation).

SS7 is a key enabler for both IN and CAMEL, and we look at it in enough detail to make sense of the signalling flows employed in IN / CAMEL service control, and discuss the different implementation and deployment options.

We build on the IN concept to illustrate how CAMEL is used to provide operator specific (IN based) services for users, even whilst roaming in other networks. A detailed explanation of the different CAMEL features is presented (organized by phases), including CAMEL's role in the Virtual Home Environment (VHE) and Open Services Architecture (OSA) concepts.

OUTCOMES & COMPETENCY DEVELOPMENT

Participants will develop or be able to:

- State the main advantages of Intelligent Networks for the provision of advanced services in modern networks, and identify typical services which could be provided using IN techniques
- Identify and evaluate the features of IN Capability Sets (ETSI and ITU)
- Draw the standard IN Architecture, describing the use of each functional entity
- Use signalling flow diagrams to show how IN can be used to enable advanced services in modern telecommunication networks
- Describe the main problems in providing Intelligent Network techniques alongside Mobility within a common SS7 network
- Draw and explain the operation of the standard CAMEL architecture
- Use signalling flow diagrams to show how the CAMEL feature can be used to enable advanced operator-specific services whilst roaming (using Intelligent Network techniques)
- List and evaluate the main features provided by CAMEL phases 1 to 4
- Identify the main charging mechanisms provided for both circuit-switched operation and GPRS within the CAMEL feature
- Using basic diagrams, illustrate typical CAMEL signalling flows for Mobile Originated, Mobile Terminated, and Mobile Forwarded services, and also for prepaid scenarios
- State three advantages of CAMEL over other prepaid solutions

COURSE CONTENTS

SECTION 1 - SERVICES IN MODERN NETWORKS

- Modern Network Architecture – A Brief Overview
- Services and Features of Modern Networks
- Advanced Services and Applications
- IN Service Support in Fixed Networks - Entities
- SS7 In Modern Networks - Basics

SECTION 2 - INTELLIGENT NETWORKS

- Switching and Signalling In Modern Networks
- Call Control – ISUP (ISDN User Part)
- Example Basic Call Scenarios
- The Intelligent Network Concept Explained
- Benefits of Using the IN Concept
- IN Services
- Service Creation
- The IN Capability Sets
- The IN Conceptual Model Explained
- The Standard IN Architecture and Functional Entities
- Basic Call State Models (BCSMs)
- The Intelligent Network Application Part (INAP)
- IN Operation - Basic Calls and Services
- Overview of the Underlying SS7 Network: INAP, TCAP, and SCCP
- Protection and Resilience
- Example Service Scenario

SECTION 3 - SS7 PROCEDURES IN SUPPORT OF IN

- Message Transfer Part of SS7
- SCCP in the Modern Network
- SCCP Architecture and IN
- TCAP Explained
- TCAP in Support of IN Procedures

- INAP - the IN Application Part of SS7
- IN Procedures and Signal Flows

SECTION 4 - IN IMPLEMENTATION

- Deployment Options
- Mapping Functional to Physical Entities
- Resilience and Redundancy
- Compatibility of Protocols
- SIGTRAN and IN
- Testing

SECTION 5 - 3GPP OPERATION

- The GSM / UMTS Architectures
- Defining Mobility and Roaming
- Procedures – Location Update, Routing a Call, Sending a Short Message
- GPRS – Its Role and Basic Operation

SECTION 6 - CAMEL – INTRODUCING IN INTO MOBILE NETWORKS

- IN Techniques In Mobile Networks – The problems
- Roaming Issues
- The Role of CAMEL
- The Features of each CAMEL Phase
- Example Services Provided by CAMEL
- Example Prepaid Architecture

SECTION 7 - CAMEL – ARCHITECTURE AND PROTOCOLS

- The Modified Mobile Architecture - Incorporating CAMEL into GSM and UMTS
- The CAMEL Application Part (CAP) and Messages Explained
- CAMEL Operation, including:
 - Basic – Mobile Originated,

- Mobile Terminated, Forwarding
 - With User Interaction
 - With GPRS
 - With SMS
 - With Location Information / Handovers
 - In Fraud Prevention
 - As a Prepay Feature
 - Interaction with the GSM Databases
- The Underlying SS7 Network
- Example Service Scenarios - with SS7 signalling flows

SECTION 8 - CAMEL AND PREPAID

- Using CAMEL For Prepaid Solutions
 - In The Home Network
 - Whilst Roaming
 - Circuit-Switched, GPRS, Short Message Service

SECTION 9 - THE EVOLVING MOBILE NETWORK

- The Role of CAMEL in the Evolving Mobile Network
- CAMEL in an Evolved Packet Core (EPC) / IP Core Network Environment
- CAMEL Phase 4 and the IMS / SIP Architecture
- PCC and CAMEL - Operation
- The Role of Diameter Signalling
- Advanced Network Signalling Scenarios

OUR TRAINING SERVICES

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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.

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- High level of Industry Experience
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All our trainers have undergone a rigorous selection 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.

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