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ETS

Course Profile

Understanding UMTS

ETS506

Duration: 3 days

- Objectives:**
- E**xplain the concepts, techniques and terminology related to UMTS.
 - P**rovide a detailed overview of the components, protocols and interfaces used in UMTS.
 - E**xamine the role and position of UMTS within the mobile marketplace.
 - D**iscuss the impact UMTS will have on the future of mobile communications.
 - E**xplore the infrastructure, air interface, protocols and the UMTS network management tasks.

Who should attend:

This course is open to any telecommunications professionals who require a good understanding of the features, services and operation of a 3G UMTS network.

Prerequisites:

Overview of Mobile Networking (ETS507). A working knowledge of IP protocols, as provided by our Internetworking with TCP/IP course (ETS308) is recommended.

Follow-on courses:

Voice over IP (ETS314), Internetworking with ATM (ETS345), Understanding MPLS (ETS361) UMTS Cell Planning (ETS524) and UTRAN Network Design (ETS513).

Course Style:

This course is presented as a mixture of teaching sessions and discussions.



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Key contents:

First Generation Mobile	2nd Generation Mobile
3rd Generation Mobile	GSM
TDMA	CDMA
Analog Systems	NMT450
NMT900	GPRS
UMTS	2.5G
TCP/IP	IPv4
Packet Switched Networks	Circuit Switched Networks
Data Rates	Frame Relay
Quality of Service	Cordless Telephony
DECT	CT1 & 2
WCDMA	UTRAN
Spread Spectrum	RAN
Node B	BSS
RNC	SONET/SDH
AAL	CAMEL
MEXE	PCM24
PCM30	UE
Soft/Softer Handovers	Gold Codes
Goulay Codes	OLPC/CLPC
FDD	TDD
MUD	Macro Diversity
Rake Receivers	Intelligent Antenna
Synchronisation	OVSF
ATM	MPLS
E1	T1
Frequency Licenses	Future enhancements
EDGE	GERAN
HSCSD	Standards Bodies



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Detailed contents:

UMTS Introduction

- History of mobile communication
- Mobile communication evolution
- GSM to UMTS evolution
- UMTS Objectives
- UMTS Characteristics
- General cellular concepts
- UMTS evolution
- Standards bodies

UMTS Network Architecture

- UMTS reference model
- Access network
- UMTS Terrestrial Radio Access Network [UTRAN]
- UMTS Core network
- Core network entity functions
- GSM & UMTS interworking

UMTS Air Interface

- UMTS frequency spectrum
- Multiple access techniques
- Coding & Spreading
- OVSF & Scrambling Codes
- Multipath signals
- Rake receivers
- Multi User Detection [MUD]
- Definition of Channel Types
- FDD, TDD
- Uplink & Downlink Channel types
- Physical channel frame structure
- Channel coding, multiplexing & rate matching
- Uplink spreading & modulation



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Detailed contents continued:

UMTS Network Interfaces

Transmission methods [E1/T1/SDH/SONET]

UMTS Network Protocols [IuCS, IuPS, Iub, Iur, Uu, Gs, Gn, Gr etc]

Asynchronous Transfer Mode [ATM]

Multi Protocol Label Switching [MPLS]

Common Channel Signalling No 7

UU Protocol Structure

UMTS Mobility Management

Numbering addressing and identification

Network registration

Location update procedure

Routing area update procedure

Security functions [Authentication & equipment validation etc]

UMTS Call Management

Mobile to land call scenario

Authentication, Ciphering and validation

Land to mobile call scenario

PDP contexts and activation

Mobile to land data routing scenario

Land to mobile data routing scenario

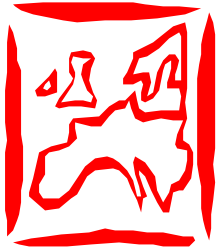
Mobile to mobile data routing scenario

UMTS Radio Resource Management

Power Control [Open & Closed Loop]

Handover Types

Handover Control



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Detailed contents continued:

UMTS Services

Comparison of UMTS to GSM

Virtual Home Environment [VHE]

Open Services Architecture [OSA]

UMTS Service providers

UMTS Bearer Capabilities [Packet & Circuit]

UMTS Teleservices [speech/data, emergency call, SMS, Fax]

Supplementary & Multimedia Services [Call forwarding and Call barring]

UMTS Services

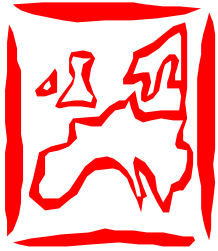
UMTS-GSM Interworking

Interworking from UMTS - GSM

Interworking from GSM - UMTS

Future Directions

Future enhancements and trends



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To book this course, or to obtain more information, contact:

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