ITU Centres of Excellence Network for CIS

A.S. Popov Odessa National Academy of Telecommunications (ONAT)

Face-to-face Training on
Complex Aspects of Mobile Network Migration of LTE technology
Odesa, Ukraine, 15-18 March 2016

TRAINING OUTLINE

COURSE DESCRIPTION

Name	**Complex Aspects of Mobile Network Migration of LTE technology**
Method of delivery	Face-to-face
Objectives	- To equip participants with understanding of modern and perspective technologies of mobile communications and broadband access in the LTE standard. - The training will enable participants to contribute to the implementation and development of mobile communication and broadband access networks in the LTE standard.
Dates	**15-18 March 2016**
Duration	4 days
Registration deadlines	1 March 2016
Training fees	- Face-to-face participation with simultaneous interpretation into English – USD 200; - Face-to-face participation without simultaneous interpretation into English – USD 100; - Remote participation without simultaneous interpretation into English – USD 50.
Course code	16WS16816CIS-R

LEARNING OUTCOMES

Upon completion of the training participants will be able to:

- Understand the evolution of mobile communication systems, in particular the current state of standardization and the introduction of 3G and 4G mobile communication systems;
- Understand main radio interfaces of IMT-2000, IMT-Advanced;

- Understand the principles of forming of content for transmission in modern broadband and mobile communication systems, in particular the principles that form the basis for the implementation of content compression methods (speech signals, video, audio and graphics), as well as the characteristics of the streams at output of MPEG, VC-1, SVC encoders for audiovisual information transmission via mobile communication networks;

- Understand the technologies used at the LTE physical layer, in particular the technical data, the frequency bands, spectral efficiency and the main technologies used at the physical layer in the LTE;

- Understand the principles of implementation of the LTE physical layer in downlink (OFDMA) and uplink (SC-FDMA), in particular formation and processing of broadband signals and multi-carrier signals;

- Understand the principles of LTE network implementation, in particular evolutionary network architecture LTE / SAE;

- Understand the principles of the frequency planning for LTE networks , in particular of the radio channel models for of mobile networks, principles of calculation of radio channel and coverage, finding of trade-off between "power efficiency" and "frequency efficiency" in modern broadband access systems;

- Understand the further evolution of LTE networks (IMT-2020 concept).

- Understand the economic aspects of LTE network implementation.

TARGET AUDIENCE

This training is targeted at technical staff, engineers, senior and mid-level management staff of communications service providers and telecommunication companies. It is also of interest to employees of Communication Administrations dealing with the issues of standartization and introduction of mobile communication on base of LTE technology.

TUTORS/INSTRUCTORS

NAME OF TUTOR / INSTRUCTOR	CONTACT DETAILS
Mr. Vladimir Baliar Associate Professor, Department of Television and Sound Broadcast A.S. Popov Odessa National Academy of Telecommunications	Email: balyar.vb@onat.edu.ua
Mr. Vadim Kaptur Vice-rector for Scientific Work A.S. Popov Odessa National Academy of Telecommunications	Email: vadim.kaptur@onat.edu.ua
Mr. Dmitry Makoveenko Chief, Radio Frequencies Department SE UNIIRT Associate Professor, Department of Television and Sound Broadcast A.S. Popov Odessa National Academy of Telecommunications	Email: dikatama.dm@gmail.com

EVALUATION

Besides the final assignment score, participants will be evaluated according to their substantive posts on the discussion forum, active participation in sessions and other course activities, reflecting both the quantity and quality of time spent on the training.

TRAINING SCHEDULE AND CONTENTS / AGENDA

March, 15, 2016, Tuesday	Time	Topics/Activities
08:30-09:00	08:30-09:00	Registration of participants
09:00-12:30	**The first half of the day**	• Lecture 1: Evolution of mobile communication systems. Main radio interfaces of IMT-2000, IMT-Advanced • Lecture 2: Principles of forming of content for transmission in modern broadband and mobile communication systems
13:30-15:30	**Afternoon**	• Practical training on models of systems and their components (not accessible for remote participants) • Testing (for remote participants Tests will send by email)
March, 16, 2016, Wednesday	**Time**	**Topics/Activities**
09:00-12:15	**The first half of the day**	• Lecture 3: Basic technologies used at the LTE physical layer • Lecture 4: Principles of implementation of the LTE physical layer in downlink (OFDMA) and uplink (SC-FDMA)
13:30-15:30	**Afternoon**	• Practical training on models of systems and their components (not accessible for remote participants) • Testing (for remote participants Tests will send by email)
March, 17, 2016, Thursday	**Time**	**Topics/Activities**
09:00-12:15	**The first half of the day**	• Lecture 5: Principles of LTE network implementation • Lecture 6: Principles of the frequency planning for networks LTE
13:30-15:30	**Afternoon**	• Practical training on models of systems and their components (not accessible for

March, 18, 2016, Friday	Time	Topics/Activities
		• remote participants) • Testing (for remote participants Tests will send by email)
09:00-12:15	The first half of the day	• Lecture 7: Further evolution of LTE networks: IMT-2020 concept • Lecture 8: Economical aspects of LTE network implementation
12:15-13:15	Afternoon	• Final test (for remote participants Tests will send by email) • Closure ceremony

METHODOLOGY

The training will include teacher – instructor presentations, case studies, group exercises and assignments.

All announcements for all events (materials, quizzes and forums) will be given several days prior to the event by the training tutor.

TRAINING COORDINATION

Training coordinator:	ITU coordinator:
Ms. Irina Politova Email: rdd@onat.edu.ua	Mr. Farid Nakhli Email: farid.nakhli@itu.int

REGISTRATION AND PAYMENT

Training Registration
Registration and payment should be made online at http://academy.itu.int/

In addition, for eLearning trainings, participants (or their entities) will have to bear costs for Internet access.

Registration on ITU Academy Portal

Please note that to be able to register for the course you MUST first create an account in the ITU Academy portal at the following address:
https://academy.itu.int/index.php?option=com_hikashop&view=user&layout=form&Itemid=559&lang=en

When you have an existing account or created a new account, you can register for the training online at the following link:
https://academy.itu.int/index.php?option=com_joomdle&view=coursecategoryextended&cat_id=:&course_id=944:complex-aspects-of-migration-of-mobile-networks-to-lte-technology&Itemid=478&lang=en

You can also register by following the steps below:

- Go to ITU Academy website home page
- On the upper hand corner, you will find search option
- Type the name of the course in the space provided and search
- When the course appears, select "book this course" and follow easy instructions to register.

Payment

A training fee of USD 200 for face-to-face participation with simultaneous interpretation into English, USD 100 for face-to-face participation without simultaneous interpretation into English and USD 50 for remote participation without simultaneous interpretation into English is applied for this training. Payment instructions can be found at the afore mentioned link.

1. On-line payment

It is encouraged to make payment via the online system using the link mentioned above for training registration at:
https://academy.itu.int/index.php?option=com_joomdle&view=coursecategoryextended&cat_id=:&course_id=944:complex-aspects-of-migration-of-mobile-networks-to-lte-technology&Itemid=478&lang=en
However, please note that only the fee of USD 100 can be issued on-line. The training fee of **USD 200** and **USD 50 will have to be made by bank transfer** by following the instructions at point 2. below.

2. Payment by bank transfer

Where it is not possible to make payment via the online system, a bank transfer may be done on the ITU Bank account shown below. In this case, it is IMPERATIVE that the applicant submits the following documents and information in advance to the ITU Coordinator:

- Proof of bank transfer payment
- Completed Registration Form
- Username and e-mail address as registered on the ITU Academy.

Failure to submit the above documents may result in the applicant not being registered for the training.

ITU BANK ACCOUNT DETAILS:	
Name and Address of Bank:	UBS SA Case postale 2600 CH 1211 Geneva 2 Switzerland
Beneficiary:	Union Internationale des Télécommunications
Account number:	240-C8108252.2 (USD)
Swift:	UBSWCHZH80A
IBAN	CH54 0024 0240 C810 8252 2
Amount:	USD 50 or USD 100
Payment Reference:	CoE-CIS 16816 P.40594.1.02