ITU Centres of Excellence Network for Europe

National Institute of Telecommunications

FACE-TO-FACE Training Course on

QoS Technologies and Regulation for Fixed and Mobile

Warsaw, Poland, Szachowa Str. 1
24-25 October 2019

COURSE OUTLINE

COURSE DESCRIPTION

Title	QoS Technologies and Regulation for Fixed and Mobile
Objectives	This course will focus on technical, business and regulatory aspects of QoS for Fixed and Mobile Networks. It includes QoS (Quality of Service) and QoE (Quality of Experience) fundamentals by ITU, as well as traffic and QoS management in Internet and IP networks. Further, it includes QoS for fixed ultra-broadband access, including QoS solutions in metallic and optical networks, carrier grade Ethernet QoS, as well as end-to-end QoS. The course also covers QoS for mobile ultra-broadband access, including 4G and 5G mobile technologies and their QoS capabilities and approaches. The telecom networks are built for provision of services. In that manner the course covers QoS-enabled services provisioning, including QoS and QoE for VoIP, video and IPTV services, as well as QoS for Internet data services (i.e., Over-The-Top services). Each telecommunication network is interconnected to other networks forming the global network of Internet and managed IP networks, so the course includes interconnection and its QoS aspects. Further, it covers generic and specific QoS parameters, KPIs (Key Performance Indicators) and their measurements. The global Internet is based on network neutrality approach for OTT/data services, so the course also covers network neutrality and its regulation. The QoS constantly increases in its importance with the digitization and innovation of various critical services, so the course includes QoS regulatory framework based on technical, business/economic and regulatory principles of QoS for services over fixed and mobile networks.

Dates	24-25 October 2019
Duration	2 days
Registration deadline	23 October 2019
Training fees	USD 500
Course code	**19WS24298EUR-E**

LEARNING OUTCOMES

At the end of the training, the participant should have gained an understanding of the key aspects of:
- QoS and QoE fundamentals by ITU
- Traffic and QoS management
- QoS for fixed ultra-broadband
- QoS for mobile ultra-broadband
- QoS and QoE for VoIP and IPTV
- QoS for Internet data services
- Interconnection and QoS
- QoS parameters, KPIs and measurements
- Network neutrality regulation
- QoS regulatory framework

TARGET POPULATION

This course is targeted at managers, engineers and employees from regulators, government organisations, telecommunication companies and academia, who are interested in understanding, implementation and regulation of QoS for Fixed and Mobile networks, including technologies, standardization, and regulation. Other institutions and individuals that are dedicated in building their capacity related to QoS Technologies and Regulation for Fixed and Mobile Networks are also welcome to participate.

TUTORS/INSTRUCTORS

NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Prof. Toni Janevski	tonij@feit.ukim.edu.mk

EVALUATION

At the end of the course participants will take part in a written test checking the level of knowledge gained during the training.

TRAINING SCHEDULE AND CONTENTS / AGENDA

AGENDA (FOR FACE-TO-FACE COURSES)

Day 1:

Time	Lecturer	Title and content of the session	Document (ppt)
09:30 10:00	**REGISTRATION**		
10:00 11:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS and QoE fundamentals by ITU**	
11:00 11:30	**COFFEE BREAK**		
Section A			
11:30 13:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**Traffic and QoS management**	
13:00 14:00	**LUNCH BREAK**		
Section B			
14:00 15:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS for fixed ultra-broadband**	
15:00 15:30	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS for mobile ultra-broadband**	
15:30 16:00	**COFFEE BREAK**		
16:00 17:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS and QoE for VoIP and IPTV**	
Day 1 Conclusions			

Day 2:

Time	Lecturer	Title and content of the session	Document (ppt)
Section C			
10:00 11:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS for Internet data services**	
11:00 11:30	COFFEE BREAK		
11:30 13:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**Interconnection and QoS**	
13:00 14:00	LUNCH BREAK		
Section D			
14:00 14:45	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS parameters, KPIs and measurements**	
14:45 15:30	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**Network neutrality regulation**	
15:30 16:00	COFFEE BREAK		
16:00 17:00	Prof. Dr. Toni Janevski, Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje	**QoS regulatory framework**	
Day 2 Conclusions			

METHODOLOGY

Face-to-face workshop. The course will be conducted as two full days lecture sessions. All participants will receive course materials in hard copy.

COURSE COORDINATION

Training coordinator:	ITU coordinator:
Name: Sylwester Laskowski	Name: Rosheen Awotar-Mauree
Email address: s.laskowski@itl.waw.pl	Email address: eurregion@itu.int

REGISTRATION AND PAYMENT

ITU Academy portal account

Registration and payment should be made online at the ITU Academy portal.
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/user/register.

Training registration

When you have an existing account or created a new account, you can register for the course online at the following link: https://academy.itu.int/index.php/training-courses/full-catalogue/qos-technologies-and-regulation-fixed-and-mobile

You can also register by finding your desired course in our training catalogue https://academy.itu.int/index.php/training-courses/full-catalogue.

Payment

1. On-line payment

A training fee of USD 500 per participant is applied for this training. Payments should be made via the online system using the link mentioned above for training registration at https://academy.itu.int/index.php/training-courses/full-catalogue/qos-technologies-and-regulation-fixed-and-mobile

2. Payment by bank transfer

Where it is not possible to make payment via the online system, select the option for offline payment to generate an invoice using the same link as above. Download the invoice to make a bank transfer to the ITU bank account shown below. Then send the proof of payment/copy of bank transfer slip and the invoice copy to Hcbmail@itu.int and copy the course coordinator. **All bank transaction fees must be borne by the payer**.
Failure to submit the above documents may result in the applicant not being registered for the training.

3. Group payment

Should you wish to pay for more than one participant using bank transfer and need one invoice for all of them, create an account as **Institutional Contact. Institutional Contacts** are users that represent an organization. Any student can request to be an institutional contact or to belong to any existing organization.
To do this, head to your profile page by clicking on the **"My account"** button in the user menu. At the bottom of this page you should see two buttons:

a. If you want to **become an institutional contact**, click on the "**Apply to be an Institutional Contact"** button. This will redirect you to a small form that will ask for the organization name. After you fill the name of the organization you want to represent, click on **"continue"** and a request will be created. An ITU Academy manager will manually review this request and accept or deny it accordingly.

b. If you want to **belong to an existing organization**, click on the **"Request to belong to an Institutional Contact"** button. This will redirect you to a small form that will ask you to select the organization you want to join from an organization list. After you select the correct organization, click on **"continue"**, a request will then be created. The

Institutional Contact that represents that organization will manually accept or deny your request to join the organization.

ITU BANK ACCOUNT DETAILS:	
Name and Address of Bank:	UBS Switzerland AG 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 500
Payment Reference:	CoE-**19WS24298EUR-E** -WBS No. P.40595.1.04

4. Other method of payment

If due to national regulations, there are restrictions that do not allow for payment to be made using options 1 & 2 above, please contact the ITU coordinator for further assistance.

CERTIFICATES

Each fully registered participant who will successfully complete the course, based on the evaluation, will receive an ITU Certificate after the course.