Training Course Outline

ITU and National Institute of Telecommunications

Online Training Course on

Wireless Access Technologies to Internet Network

7-14 March 2022

Title	Wireless Access Technologies to Internet Network
Modality	Online training course
Dates	7-14 March 2022
Duration	8 Days
Registration deadline	7 March 2022
Training fees	USD 150
Description	This course focuses on Wireless Access Technologies to Internet Network including technical, business and regulatory aspects. It includes wireless and mobile evolutions including mobility approaches by IETF and 3GPP, 4G access technologies by 3GPP (LTE/LTE-Advanced), as well as Evolved Packet Core (EPC). The course also covers the other 5G technology accepted by the ITU umbrella IMT-2020, 5G New Radio (5G NR) and 5G Core, as well as WiFi access technologies from the IEEE. Further, it includes QoS (Quality of Service) in mobile and wireless networks, mobile VoIP (Voice over IP) and mobile IPTV, OTT (Over The Top) broadband Internet services in wireless and mobile networks, as well as QoS assessment and QoS parameters for mobile services. Finally, the course focuses also on regulatory and business aspects for wireless and mobile broadband access to Internet.
Course code	22OI27802EUR-E

1. LEARNING OBJECTIVES

This course focuses on Wireless Access Technologies to Internet Network including technical, business and regulatory aspects. It includes wireless and mobile evolutions including mobility approaches by IETF and 3GPP, 4G access technologies by 3GPP (LTE/LTE-Advanced), as well as Evolved Packet Core (EPC). The course also covers the other 5G technology accepted by the ITU umbrella IMT-2020, 5G New Radio (5G NR) and 5G Core, as well as WiFi access technologies from the IEEE. Further, it includes QoS (Quality of Service) in mobile and wireless networks, mobile VoIP (Voice over IP) and mobile IPTV, OTT (Over The Top) broadband Internet services in wireless and mobile networks, as well as QoS assessment and QoS parameters for mobile services. Finally, the course focuses also on regulatory and business aspects for wireless and mobile broadband access to Internet.

2. LEARNING OUTCOMES

At the end of the training, the participant should have gained an understanding of the key aspects of:
- Wireless and Mobile Internet fundamentals
- 4G access technologies by 3GPP: LTE/LTE-Advanced
- Evolved Packet Core (EPC) for mobile Internet network
- 5G technologies by 3GPP: 5G NR and 5G Core
- WiFi access technologies: IEEE 802.11n/ac/ad
- QoS in wireless and mobile networks
- Mobile VoIP and mobile IPTV
- OTT (Over-The-Top) broadband Internet services in wireless and mobile networks
- QoS assessment and QoS parameters for mobile services
- Regulatory and business aspects for wireless and mobile broadband access to Internet

3. 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 Wireless Access Technologies to Internet Network, including technologies, standardization, regulation and content. Other institutions and individuals that are dedicated in building their capacity related to Wireless Access Technologies to Internet Network are also welcome to participate.

4. ENTRY REQUIREMENTS

No prior knowledge or qualification is required to register for this course, considering the given target population.

5. TUTORS/INSTRUCTORS

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

6. TRAINING COURSE CONTENTS

There are in total eight days, from which first 5 days (7-11 March) there will be given recorded video lectures, 2 per day, five days in total and that gives the total of 10 video lectures in this course. The lectures are on the following subjects:

Lecture	Subject
Lecture 1	Wireless and Mobile Internet Fundamentals
Lecture 2	4G access technologies by 3GPP: LTE/LTE-Advanced
Lecture 3	Evolved Packed Core (EPC) for mobile Internet network
Lecture 4	5G technologies by 3GPP: 5G NR and 5G Core
Lecture 5	WiFi access technologies: IEEE 802.11n/ac/ad
Lecture 6	QoS in wireless and mobile networks
Lecture 7	4G mobile VoIP and mobile IPTV
Lecture 8	OTT (Over-The-Top) broadband Internet services in wireless and mobile networks
Lecture 9	QoS assessment and QoS parameters for mobile services
Lecture 10	Regulatory and business aspects for wireless and mobile broadband access to Internet

7. TRAINING COURSE SCHEDULE

Days	Topic	Exercises and interactions
Day 1	Lecture 1. Wireless and Mobile Internet Fundamentals Lecture 2. 4G access technologies by 3GPP: LTE/LTE-Advanced	Watching and listening to video lectures 1 and 2. Answering on questions asked by the tutor, and possibility to ask questions to him via course forum.
Day 2	Lecture 3. Evolved Packed Core (EPC) for mobile Internet network Lecture 4. 5G technologies by 3GPP: 5G NR and 5G Core	Watching and listening to video lectures 3 and 4. Answering on questions asked by the tutor, and possibility to ask questions to him via course forum.
Day 3	Lecture 5. WiFi access technologies: IEEE 802.11n/ac/ad	Watching and listening to video lectures 5 and 6. Answering on questions asked

	Lecture 6. QoS in wireless and mobile networks	by the tutor, and possibility to ask questions to him via course forum.
Day 4	Lecture 7. 4G mobile VoIP and mobile IPTV Lecture 8. OTT (Over-The-Top) broadband Internet services in wireless and mobile networks	Watching and listening to video lectures 7 and 8. Answering on questions asked by the tutor, and possibility to ask questions to him via course forum.
Day 5	Lecture 9. QoS assessment and QoS parameters for mobile services Lecture 10. Regulatory and business aspects for wireless and mobile broadband access to Internet	Watching and listening to video lectures 9 and 10. Answering on questions asked by the tutor, and possibility to ask questions to him via course forum.
Day 6-7	Consolidation of knowledge	Possibility to watch all video lectures one again with possibility to ask questions to the tutor.
Day 8	Final Quiz	Solving the Final Quiz.

8. METHODOLOGY (Didactic approach)

The course methodology will be as follows:
- Each day from 7 to 11 March 2022 there will be made available two recorded video lectures, which are recorded in the face-to-face ITU Centre of Excellence workshop organised by National Institute of Telecommunications in Poland. In total there are 10 video lectures during the course.
- Discussion forum will be organized based on discussion topics given on a daily basis, where students are highly encouraged to participate and interact with instructors and other students.
- Quiz test will be assigned on the last day of the course, 14 March 2022.
- All announcements for all events (lectures, quiz and forum) will be given in a timely manner (prior to the event) by the course tutor.

9. EVALUATION AND GRADING

On the last day of the course a quiz test will be assigned. It will consist of 20 questions (multiple choice) witch should be solved in a time frame of 90 minutes, with at least 12 correct answers (60%).

The course evaluation for obtaining the certificate at the end is based primarily on the results from the Quiz, however, replies to the raised discussion topics may also be considered in the evaluation process.

10. TRAINING COURSE COORDINATION

Course coordinator:	**ITU coordinator:**
Name: Sylwester Laskowski Email address: S.Laskowski@il-pib.pl	Name: Jaroslaw Ponder Email address:

11. CERTIFICATES

Each fully registered participant who successfully completes the course, based on the evaluation, will receive an ITU Certificate for this course.