



ITU Academy

Regional Experiences from Europe

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ITU Academy web portal

<http://academy.itu.int>

ITU Academy
URL

Here is given a
link to upcoming
ITU Academy
trainings

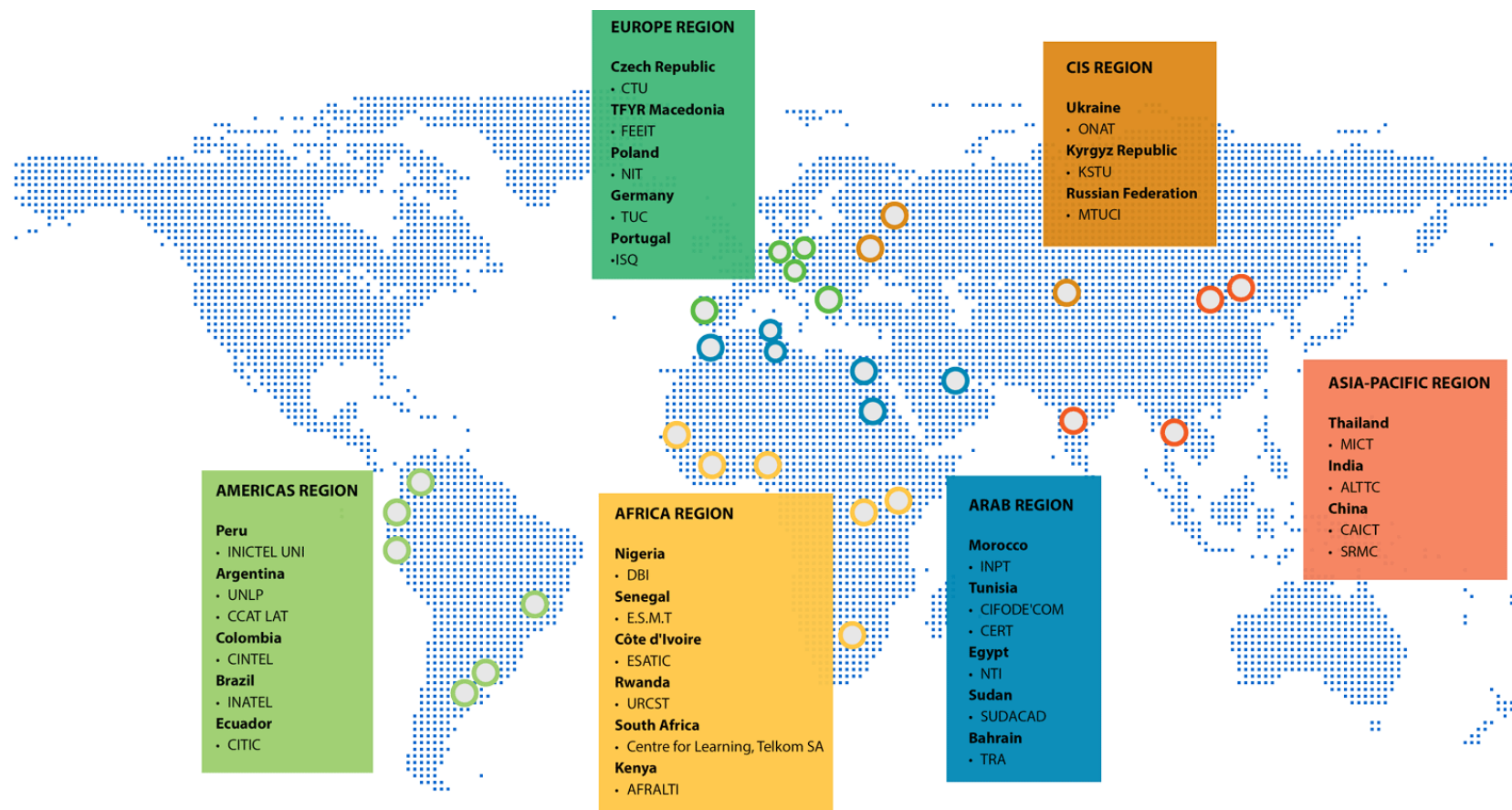
The GCBI
information

The screenshot shows the ITU Academy website interface. A red box highlights the URL <https://academy.itu.int/index.php?lang=en> in the browser's address bar. Another red box highlights the 'UPCOMING TRAININGS' section, which lists three courses: 'Protocolos de Comunicaciones para Internet de las...', 'Emerging Trends in Regulation of ICTs', and 'Legal and regulatory barriers to the introduction...'. A third red box highlights the 'GROUP ON CAPACITY BUILDING INITIATIVES (GCBI)' section, which states that GCBI works to assist ITU-D and contribute to the successful implementation of its capacity building activities. A fourth red box highlights the 'GLOBAL ICT CAPACITY BUILDING SYMPOSIUM' section, which mentions that the ITU Global ICT Capacity Building Symposium (CBS) is the main global event for capacity development in the field of ICT. The website also features sections for 'COURSES', 'WHAT'S NEW', 'PARTNERSHIPS', 'MY COURSES', 'VIDEOS', 'TRAINING PROGRAMMES', and a 'SUBSCRIBE' form.



ITU CoE global network

- The **ITU Centres of Excellence (CoE) network** is composed of **32 Centres** across the globe, six each in the Africa, Americas, Arab, and Asia-Pacific regions, **five in the Europe region** and three in the CIS region.





User identification in the ITU Academy

ITU Academy user account is uniquely identified by the user's email address.

NGN, Cloud Computing x

International Telecommunications Union (ITU) [CH] | <https://academy.itu.int/courses/user/view.php?id=209&course=1125>

ITU Academy
empowering minds

You are logged in as TONI JANEVSKI (LOG OUT)

HOME THE ACADEMY TRAINING EVENTS MY PROFILE MY COURSES LEARNING RESOURCES REGISTRATION HELP ARCHIVE MY INVOICES

EDIT PROFILE

Toni Janevski

ADMINISTRATION

- Course administration
- Switch role to...

PEOPLE

- Participants

LATEST NEWS

Add a new topic...

Closing words on the ITU Academy course "NGN, Cloud Computing and Ultra Broadband"

28 Jun, 00:57 Toni Janevski

Older topics...

RECENT ACTIVITY

Activity since Tuesday, 5 September 2017, 1:36 AM

Full report of recent activity...

No recent activity

HOME / TECHNOLOGIES AND SERVICES / 19263-NGN, CLOUD COMPUTING AND ULTRA BROADBAND / PARTICIPANTS / TONI JANEVSKI

Toni Janevski

Toni Janevski, PhD, is a Professor at the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University in Skopje, Macedonia.

User details

- Edit profile
- Email address: **tonij@feit.ukim.edu.mk**

Country: Macedonia

City/town: Skopje

Administration / Ministry: ☐

Administration / Regulator: ☐

Telecom / ICT Agency: ☐

Miscellaneous

- Full profile
- Blog entries
- Notes
- Forum posts
- Forum discussions

Reports

- Today's logs
- All logs
- Outline report
- Complete report
- Statistics
- Browser sessions

Login activity

Last access to course: Thursday, 7 September 2017, 1:36 AM (1 sec)

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ITU Academy course cover page

Inside view

Title of the
ITU Academy
course.

Tutors and
coordinators.

Course: Giga Speed Wire X

International Telecommunications Union (ITU) [CH] | <https://academy.itu.int/courses/course/view.php?id=1118>

ITU Academy
empowering minds

You are logged in as TONI JANEVSKI (LOG OUT)

HOME THE ACADEMY TRAINING EVENTS MY PROFILE MY COURSES LEARNING RESOURCES REGISTRATION HELP ARCHIVE MY INVOICES EDIT PROFILE

ADMINISTRATION

- Course administration
 - Turn editing on
 - Edit settings
- Users
- Filters
- Reports
- Grades
- Badges
- Question bank
- Repositories
- Switch role to...

PEOPLE

- Participants

LATEST NEWS

Add a new topic...

Closing words on the ITU Academy course
"Giga Speed Wireless and Mobile Broadband Internet"
20 Dec, 00:49 Toni Janevski

Older topics ...

RECENT ACTIVITY

Activity since Friday, 23 February 2018, 4:02 AM

Full report of recent activity...


No recent activity...

HOME / TECHNOLOGIES AND SERVICES / 19264-GIGA SPEED WIRELESS AND MOBILE BROADBAND INTERNET

ITU


ITU Centres of Excellence Network

GIGA SPEED WIRELESS AND MOBILE BROADBAND INTERNET




Tutor & Coordinator: Toni Janevski
Training Coordinator:

Dates: 21 Nov - 18 Dec 2017



ITU Centres of Excellence Network for Europe

Giga Speed Wireless and Mobile Broadband Internet



Tutor & Coordinator: Prof. Dr. Toni Janevski
Tutor Assistants: Dr. Tomislav Shuminoski, Dr. Pero Latkoski
Training Coordinator: Jaroslav Ponder

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Types of ITU CoE courses in Europe region

■ **Face-to-face** courses:

- Typically at the premises of the CoE in the Europe region, with logistical support of the ITU Academy platform.

■ **E-learning** courses:

- Typically delivered fully via the ITU Academy platform
- E-learning courses in Europe region are currently delivered in two modes:
 - **Classic** mode: 4 weeks e-learning course with written materials.
 - **Blended** mode: 8 days e-learning course with prerecorded video lectures (from a face-to-face ITU course).



ITU Academy e-learning courses:

Best experiences in period 2010-2013

ITU Academy e-learning course	Year	Enrolled participants	Participants with certificates	Number of countries
Next Generation Networks - NGN	2010	77	69	17
NGN services VoIP and IPTV	2011	66	59	20
Next Generation Mobile and Wireless Networks	2011	100	89	33
Future Internet	2012	101	82	39
Mobile Broadband: LTE/LTE-Advanced, WiMAX and WLAN	2012	189	144	44
Broadband and Next Generation Networks	2013	150	124	45
4G Mobile and Future Internet	2013	149	97	40



ITU Academy e-learning courses:

Best experiences in period 2014-2017

ITU Academy e-learning course	Year	Enrolled participants	Participants with certificates	Number of countries
NGN, Future Networks and Cloud Computing	2014	130	82	44
Wireless and Mobile Broadband Internet	2014	215	131	50
Next Generation Broadband Internet Access	2015	139	86	40
Mobile Broadband	2015	157	77	36
Broadband Internet and Future Networks	2016	123	116	40
4G and Next Generation Mobile Internet	2016	73	65	36
NGN, cloud computing and ultra-broadband	2017	106	86	26
Giga Speed Wireless and Mobile Broadband Internet	2017	64	54	26

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Type of participants in ITU Academy e-learning courses

- Different types of participants follow a given e-learning course, and they are coming from different organizations, including:
 - ☐ National regulators
 - ☐ Government organizations and ministries
 - ☐ Network and service providers
 - ☐ Telecom and IT companies
 - ☐ Students from universities
 - ☐ Professors from academia and instructors from training centers
 - ☐ ...and every individual which want to update their knowledge or have up-to-date information in a given field
- Different participants may have different interests and different focuses in a single ITU e-learning course, since most of them are professionals
 - ☐ Working in telecommunications/ICT or related fields
- Let see some feedback from participants regarding their benefits from ITU e-learning practices



ITU e-learning Feedback from Participants: Broadband Internet and Future Networks (2016)

- I am at a desk job and this course has certainly added to my knowledge on the latest technologies. I found the course to be very useful.
- One of the most areas that would be benefited is net neutrality issues.
- The course helps us to have a more comprehensive view of the evolution of the Internet and broadband networks and their potential use in sustainable cities.
- The course is relevant as it makes me understand better the world of ICT. This is an advantage as when am analysing the data from administration side (supply side) i understand better. It also helps me in writing ICT related papers.
- n/a
- Sure, My organization is a provider. This course has added to my knowledge and i has understood the overview of Broadband Internet and Future Networks.
- It will help me in analysing the ICT statistics and writing reports on the same better
-
- I work for the Turkish Regulatory Body (ICTA) and Training materials include up to date information. Very helpful for the regulation side of the sector.
- It helps my organisation through proper understating of new technologies. Planning benefits a lot.
- I'm in academic sector, the main benefit is in order to study the ultimate regulation on telecommunications technologies.
- The mindset of the participants is definitely changed and right now I see things in a different perspective. I realise that there is no other way into the future than plan for the Future Networks.

- It provides a good understanding of where the ICT industry is currently at and the future of it (which is closer than we think). It provides for greater appreciation of the subject and helps in preparing for it.
- It provides a general point of view on the emerging technologies.
- It will contribute towards my daily work and enhance my knowledge on future networks and where technology is heading to and what to expect.
- My organization benefit from this course in many aspects. First we need to build our capacity in the novel new areas of ICTs like OTT, IoT, NGN, 5G, etc... in terms of the technical and legal aspects with the new economy challenges that we will be facing. So sharing best practices by discussing with other people all around the world is a very good way that has been possible within the course earned by ITU Academy. I'm a professional of Telecommunication but this course helped me understand some new guidelines and business trends of the economy. Thanks to all of you ...
- The organization was excellent and this e-learning course was very informative, very well presented, plus enjoyable.

Thanks for all.

- I am more enlightened.

I will assist my organization to understand the Broadband and Future Networks trends so

Each ITU course has participants from
regulators, operators, academic sector...

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ITU e-learning Feedback from Participants: 4G and Next Generation Mobile Internet (2016)

In your opinion, how your organization benefiting from the knowledge and experience you acquired through this course? *Please explain*

- The mobile network operator where I work has just recently rolled out it's first LTE service. I believe that the knowledge acquired in this course will help to make better decisions during technical design, procurement, commissioning and troubleshooting of the LTE network. In summary, the things that I have learned from this course will help me to do my job better.
- I thing, the knowledge I acquired trough this course, will be useful in performance analysis of technical as well as business and regulation issues for 4G and next generation networks.
- I work at NTRA of Egypt , this course (material and interactions and discussions quizzes) are very useful for me and NTRA as a regulator (important knowledge, technical, administration) plus in my personal life.
- In my working domain it is necessary to understand the new technologies appearing in the mobile market. So the course covers this requirement.
- Show a certain level of interest in ITU courses.
- Being in charge of the regulatory and policy affairs in my organisation this course is relevant to my position and strengthened me to face regulatory and business challenges even technical aspects of 4G, 5G and Mobile Internet broadband.
- Let me know the origin and trends of the mobile network characteristics and topologies. I will apply this knowledge for analysis and recomendations in my job.

- As an engineer with the national Telecom regulator, it is important to be on top of the current in next generations networks. I will now advice my entity on all technical issues of next generation mobile networks. I will also advice them on what to do as a regulator to prepare for the deployment of 5G networks.
- It will help to implement LTE into our network.
- More knowledge, better professional
- As an expert in Technical Directorate I think that every part of this course would be so helpfull for me in my work.
- Now that I have deeper knowledge in the area I could better see the real picture when preparing and assessing legal acts, solving questions at the NRI.
- In my particular case, I took the course to deepen knowledge in mobile networking issues in order to complement my knowledge because I am involved in virtualization technologies (NFV). Therefore this would benefit my research for the doctorate.
- I work at Regulatory body and especially at IT unit so i must know these stuff clearly which the gave me. It will help in regulatory functions in my office
- The will benefit an increase in technical input due to increased knowledge

Each participant and organization has its specific benefit from a given ITU course.



ITU e-learning Feedback from Participants: NGN, Cloud Computing and Ultra-Broadband (2017)

In your opinion, how your organization benefiting from the knowledge and experience you acquired through this course?, *Explain*

- We are public telecom operator and we follow requirements of our cotumer and markets.
- In my opinion i get many useful information and knowledge witch i can use to support my organization.
- Information is power.
NGN is the future of the networking. If you are working in the networking and not be informed of its evolution, you will be exceeded in a short time. This technology goes at the speed of MACH. Networking is a dynamic technology.
-
- The knowledge and experience I acquired through this course will help me for future work in my company especially in NGN environment.
- As a National Regulators my entity needs to have vast knowledge and understanding in all forms of telecommunications. This will enable her to render sound decisions in regulating the telecommunications sectors properly.
- Since ICT Office is a national agency in implementing and regulatory entity in terms of ICT here in the Philippines, this course definitely contributed a lot in terms of net technologies and the likes.
- This is good course, I need to share the NGN and Clouding computing. let org know about it
- In my opinion they will get some on one who can involve on the future networks design and recommendation. This course helps me to acquire this knowledge.

- As a regulatory body of Nepal, I have gain knowledge about How can correlate cloud computing and NGN in telecom industry.
- This training will allow me to improve the courses I taught already, including NGN. Cloud Computing and Mobile Cloud Computing are new acquisitions but very beneficial for my school
- I would be able to understand the new concepts in a better way and utilize the acquired knowledge.
- ..
- I will be usage the knowlegde gain during this training in my work and also will help desired colleagues or others to understand the FN and cloud computing.
- After this course I know more about future network and this knowledge will definitely help me in my future work.
- I have new knowledge that I could put into practice in my various courses at our institute
- The knowledge about ICT trend is necessary for the employees to have self development and to gain important skills in their occupations.
- I am working in telco operator and we are faceing with this migration phase.
- It has give me much more insights into NGN in a very concise and comprehensive manner too.

Each ITU course is global, reaching all regions and countries worldwide.



ITU e-learning Feedback from Participants: Giga Speed Wireless and Mobile Broadband Internet (2017)

In your opinion, how your organization benefiting from the knowledge and experience you acquired through this course? *Please explain*

- in near future, this knowledge would be in every day use in terms of planning of our organization.
- Better understanding for the upcoming network
- more confident in dealing with 4G/LTE devices, better understanding
- future RFP preparation can be done easily
- Our organization is Communications Regulatory Authority seeking the most advanced technological progress and quality of services. The main functions are supervision of radio spectrum and consistent planning of radio frequencies. So, the experience of the course may be applied in in our daily work, for example drafting national plans for 5G installation.
- All information is usefull and will be applied in development of future regulatory documents.
Also received knowledge and experience increase professional level.
- With my better overlook on this topic
- This course will help my organization to be better prepared for the future of Mobile telephony.
- i have acquired lot of knowledge related to lot of technologies that have been detailed in this course and on my side IoT topics were so informative and according to that i am planning to come up with some IoT project using this course as guidance to easily implement it
- As Telecoms regulator, I am supposed to be on top of issues to enable me regulate all aspects of the telecoms industry. As such the knowledge i have acquired would be very beneficial in this aspect in that the content were up-to-date and dealt into the future.
- I work for regulatory department and therefore, learning from ITU courses better equip me for Policy/Regulatory discussions

- The course deals with antecedents, topics and aspects in process and on topics that will be discussed in the world radiocommunication conferences in the near future and this is fundamental for the administrations and for the personnel that prepare the documentation of officials that will participate in them. It shares knowledge that is important for making future decisions.
- This course has better my knowledge in wireless transmission field. This will benefit the organization in any wireless transmission works that may be assigned to me.
- The course allowed me to know relevant aspects of the current and new technologies that will help me in the moment of interpreting the current regulation in the region and propose new regulations as they are implemented in the telecommunications market.
- Knowledge about these things are essential to do the job and meet the targets (supervise that use of radio equipment don't cause harmful radio interferences).
This course was great opportunity substantially update knowledge about mobile technologies in short time.
- Permanent employee improvement brings benefits to any organization, and studying up-to-date material about ever-evolving technologies is a guarantor of stability and innovation in every field.
- This training allowed me to understand the issues of 5G technology and the benefits it will bring us in the future

One the most challenging issues for course participants is to prepare themselves, their organizations and their countries for the future...



Emerging capacity development issues from the European regional perspective

- The Europe region can be considered as a developed one regarding the ICT/telecom sector.
- However, the new ICT/telecommunications technologies appear continuously, so capacity building is very important for employees in the ICT/telecom sector in Europe as well as other regions:
 - There are **new standards** from the technology aspects, such as higher speed for fixed access (e.g., FTTH, VDSL2) or mobile access (4G, near soon 5G).
 - There are continuously **new challenges** such as network neutrality, security issues, Quality of Service (QoS) issues, interconnection issues, and many more.
 - All such issues require **capacity building for professionals**, and that is the same for all regions, including the Europe region:
 - One may say that capacity building is continuously needed in both, developed and (still) developing ICT/telecom markets.



Students at the Universities versus participants in the ITU Academy courses

- For students at the university there is more:
 - Theory
 - Analytical exercises
 - Lab exercises
- For participants in the ITU courses, typically employed professionals, the experience shows that ITU e-learning course is good to provide:
 - Less analytical approach with equations (since math is harder to learn on distance)
 - More interdisciplinary approach, such as **combination of the technology, business and regulation aspects**
 - Of course, there is needed knowledge in different fields to provide higher value into the contents and the course in general



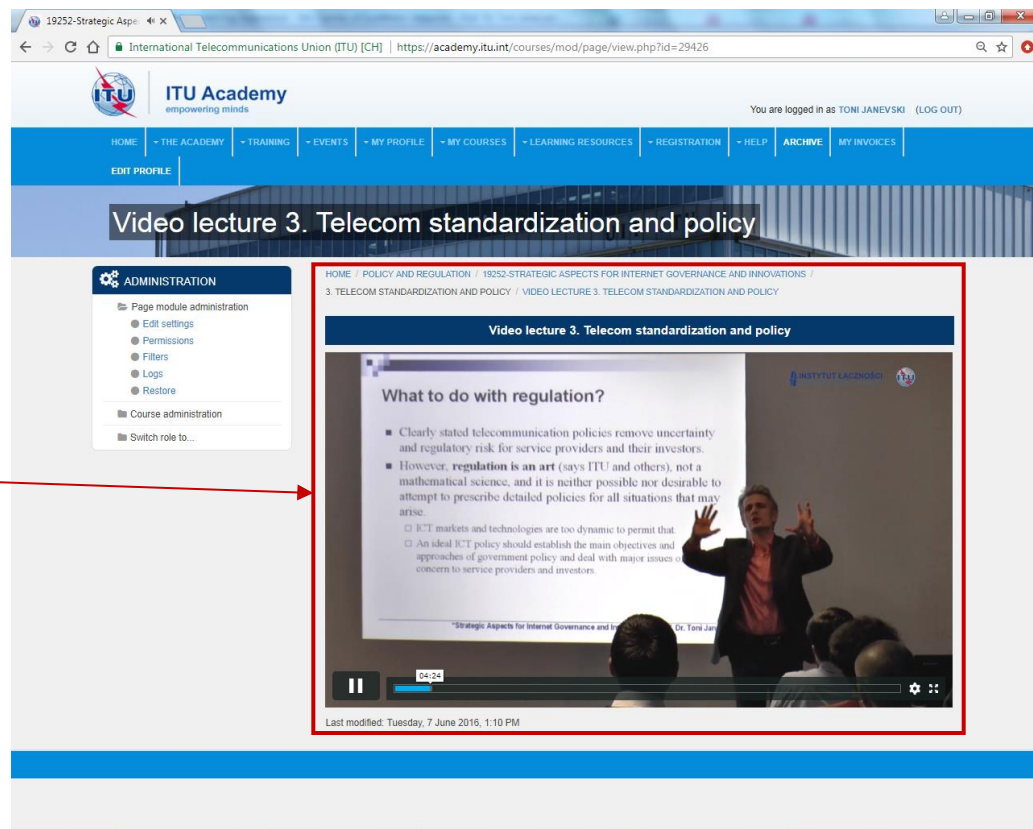
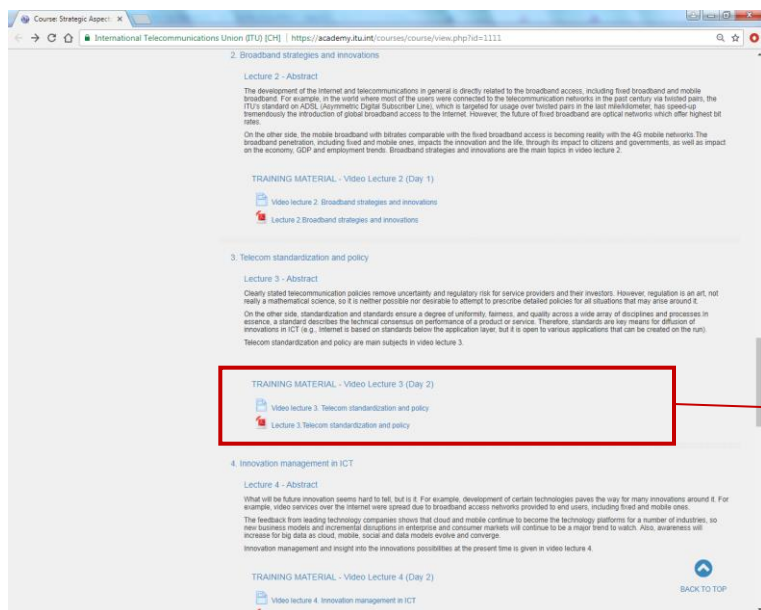
Key element for success of ITU CoE: Increase and maintain the appeal for trainings offered via the ITU Academy

- Main approach which brings success is:
 - To **continue the successful** programmes with updated curricula
 - To use **multiple delivery channels**: e-learning trainings, face-to-face, blended
 - To use ITU Academy as a medium for **capacity-building** of managers and engineers, but also other with **inter-disciplinary** interests in telecommunications/ICT areas
- To create and deliver well structured and well designed courses, considering the ITU focus areas:
 - For example, defined by the **World Telecommunication Development Conferences** (WTDC).
- To use already proven **successful practices** (where participants are satisfied) and to provide **consistency** in the courses delivery
 - Participants that are satisfied by a given course will join some of next ITU courses, and vice-versa.



ITU CoEs collaboration: E-learning based on face-to-face training

- ITU face-to-face training (in Warsaw 2015) is video recorded and after the post-production it is used for ITU e-learning course on the ITU Academy in 2016, 2017, and 2018.



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And again the same, because it was a success!

- ITU face-to-face training (in Warsaw 2016) is video recorded and after the post-production it is used for ITU e-learning course on the ITU Academy in 2017 and scheduled for 2018.

The screenshot displays the ITU Academy website interface. At the top, the ITU logo and 'ITU Academy empowering minds' are visible, along with a user login status: 'You are logged in as TONI JANEVSKI (LOG OUT)'. A navigation bar includes links for HOME, THE ACADEMY, TRAINING, EVENTS, MY PROFILE, MY COURSES, LEARNING RESOURCES, REGISTRATION, HELP, ARCHIVE, and MY INVOICES. Below this, an 'EDIT PROFILE' link is present. The main content area features a large banner for 'Video lecture 8. OTT (Over-The-Top) broadband Internet services in wireless and mobile networks'. To the left, an 'ADMINISTRATION' sidebar lists options like 'Page module administration' (Edit settings, Permissions, Filters, Logs, Restore) and 'Course administration'. The main content area includes a breadcrumb trail: HOME / TECHNOLOGIES AND SERVICES / 20619-WIRELESS ACCESS TECHNOLOGIES TO INTERNET NETWORK / 8. OTT (OVER-THE-TOP) BROADBAND INTERNET SERVICES IN WIRELESS AND MOBILE NETWORKS / VIDEO LECTURE 8. OTT (OVER-THE-TOP) BROADBAND INTERNET SERVICES IN WIRELESS AND MOBILE NETWORKS. Below this, a video player shows a lecture titled 'Video lecture 8. OTT (Over-The-Top) broadband Internet services in wireless and mobile networks'. The video frame shows a man in a blue blazer pointing at a presentation slide titled 'Example of P2P Service: Skype'. The slide lists several bullet points about Skype's P2P service. Below the video player, it states 'Last modified: Tuesday, 25 July 2017, 5:22 PM'.



The global power of ITU Academy

- In **ITU Academy e-learning courses** held by CoEs in the Europe region in period 2014-2018 (4 years) there were participants from more than **130 countries**:
 - Around 30 countries from Europe region
 - More than 100 countries from all other regions around the globe.
- This is close to participation in Olympic games, but why?
 - Because **ITU is respected** in the ICT/telecom world, particularly among regulators and telecom operators.
 - Due to **consistency and quality of ITU e-learning courses** delivery via the ITU Academy platform.
 - Last, but not the least important, **due to ITU Academy platform, its features, reliability and scalability.**



Europe: ITU Academy e-learning participation from countries in the Europe region

Albania
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Czech Republic
France
Germany
Greece
Iceland
Italy
Kosovo
Latvia
Lithuania

Malta
Moldova
Montenegro
Netherlands
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Switzerland
Turkey
Ukraine
United Kingdom

Country names are given in alphabetical order



Europe: ITU Academy e-learning participation from countries in other regions in the world

Afghanistan
Algeria
Angola
Argentina
Azerbaijan
Bahamas
Bahrain
Bangladesh
Benin
Bhutan
Bolivia
Botswana
Brazil
Brunei Darussalam
Burkina Faso
Cambodia
Cameroon
Colombia

Comoros
Congo
Costa Rica
Cote D'Ivoire
Cuba
Curacao
Democratic Republic of Congo
Dominican Republic
DR Congo
Ecuador
Egypt
El Salvador
Ethiopia
Fiji
Gambia
Georgia
Ghana
Guyana
Haiti

Honduras
India
Indonesia
Iran
Jamaica
Kenya
Lebanon
Lesotho
Liberia
Liberia
Libya
Lybia
Madagascar
Malawi
Malaysia
Mali
Mauritius
Mexico
Mongolia

Country names are given in alphabetical order

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Europe: ITU Academy e-learning participation from countries in other regions in the world

Namibia
Nepal
Netherlands Antilles
New Zealand
Nicaragua
Niger
Nigeria
Oman
Pakistan
Papua New Guinea
Paraguay
Peru
Philippines
Qatar
Republic of Trinidad and Tobago
Rwanda

Saint Kitts and Nevis
Saint Lucia
Samoa
Saudi Arabia
Senegal
Sierra
Sierra Leone
Singapore
Solomon Islands
Somalia
South Africa
Sri Lanka
St. Maarten
Sudan
Suriname
Tanzania

Thailand
Togo
Tokelau
Trinidad and Tobago
Tuvalu
Uganda
United Arab Emirates
United States
United States of America
Uruguay
US
Vanuatu
Yemen
Zaire
Zambia
Zimbabwe

Country names are given in alphabetical order

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Key element for success of ITU CoE: Creating excellent e-learning practices

- Best e-learning practices are created by evolution of courses and the e-learning process by:
 - Finding the most relevant **subject** areas/sub-areas
 - Preparing quality training **materials** in a timely manner
 - Structuring of courses and alignments to **learning objectives**
 - Providing **professional** and encouraging work
 - Improving the course **organization**
 - Having dedicated tutor **assistants** for longer e-learning courses
 - Setting a course scheme that fits participants needs and creates **high user experience**
 - **Focusing on students** (i.e., course participants) and what they need:
 - Organization and **coordination** before, during and after the course
 - **Quick response** on all queries on all issues (e.g., contents, administration, anything else)
 - **Good timing** of all events (e.g., modules, forums, quizzes)
 - **Consistency** in everything related to the e-learning course
 - Having **efficient administration** before and after the course





Key element for success of ITU CoE: Applying academic standards to ITU e-learning courses

- Working on the e-learning courses with **dedicated assistance**
 - For preparation and delivery of the training material
 - So, the tutor can render direct support to students in terms of discussions of the materials in dedicated forums on the course pages in the ITU Academy
- Having well **organized logistics** for all issues important for the course participants
 - Prior the course (for registration), during the course (for delivery of the contents) and after the course (for course evaluation and certification)
- **Evaluation** of the ITU courses
 - Use of **University academic standards** in undertaking assessments (one Quiz test per week, evaluating all answers in the Forums)
 - Required overall average success **grade of 60%** to obtain an **ITU certificate** after the course.
 - Use of received **Feedback** from the participants.



Issues for the ITU Academy success story everywhere?



- ITU and Academia (Professors/Instructors/Experts) need:
 - To provide **excellence of the training** (including organization, creation, coordination, delivery, and certification)
 - To provide diversity of ITU Academy trainings
 - For **capacity building of all ages**, with focus to ICT professionals
 - To deliver information about a given ITU course to different parties (that is the course marketing)
 - To **complement university level education** on long terms
 - This is crucial for the success.
- ITU Academy as a single web-based platform needs:
 - To maintain **high reliability** (e.g., administrators' work)
 - To continue with the online and offline (with invoices) **payments** for course enrolments
 - To continue all **different tools** for courses delivery



What else is needed for success of the capacity building?

- That “ingredient” is having emerging ICT/telecom trends which inspire and “drive” all of us.
- But, are there such?
- Yes, there are... but, since when?
 - Well, the rapid development of telecommunications in the past two and half decades was triggered by the appearance and spread of Internet and Internet technologies for building all networks and all services.
 - Internet provided separation of services from underlying transport infrastructures, and ITU has done it in a similar manner for the traditional telecom world with NGN and further with the Future Networks umbrella...

What are emerging ICT trends in Europe?

- **Ultra-broadband** access by 2020 (then it will increase further to another target for another year in the future).
- **Cloud computing** (almost all Internet services use cloud computing).
- **Mobile technologies** (they made the communications personal and individual and spread the broadband Internet to places where it was not available before).
 - For example, around 2020 we expect 5G (there is currently 3GPP Release 15 development as the initial 5G)
 - Then, there will be very likely 6G by 2030 (one decade per mobile generation is already a “law”, one way or another).



Other ICT trends in Europe now?

- **Massive Internet of Things** (finally to do it with the help of the mobile networks, it is time for that, it has been 13 years from ITU's book on IoT).
- **Network virtualization** (NFV, SDN, network slicing - new trends)
- **NGN implementation** especially in mobile networks (mobile networks are lagging behind fixed network here also in Europe).
- **Quality of Service (QoS)** – although European regulators use light touch approaches on QoS unlike some other regions, the QoS can be a game changer when IoT will spread (think about driverless cars controlled via a mobile network)
 - **Network neutrality** is here as always hot ICT trend, which speeds innovations and divides various stakeholders about its future – to keep it or change it (or specialized services in Europe have well done the job).
- **Smart things**, such as smart homes, smart cars, smart cities, smart everything around us... and this is not the complete list of emerging ICT trend, but who has it after all...
 - Maybe some things smart like us – the humans – the AI in ICT is some future...



Summary

- **ITU CoE in Europe** region in the last 4 years period was very successful, educating around **1000 participants** from **more than 130 countries** from all regions.
- **ITU Academy** is the **ITU's OTT (Over-The-Top) service** platform for capacity building in the ICT/telecom sector
 - It is **respected** by all professionals, including regulators, telecom operators, companies, academia, and all other parties.
 - It creates **equal and unique possibilities to participants from different countries** to be virtually on a same place for the same purpose – capacity building in ICT/telecommunications!
- There are continuously **new issues and new challenges in the ICT/telecom** world from technology, regulation and business aspects
 - ITU CoE network with the ITU Academy platform provide timely and quality **capacity building** for all such issues **to everyone around the globe**.



Thank you for your attention!