

ITU Centres of Excellence for Europe

Training opportunities
2019



The Abdus Salam
International Centre
for Theoretical Physics

INSTYTUT ŁĄCZNOŚCI
PAŃSTWOWY INSTYTUT BADAWCZY

Nachrichten-Technische
Hochschule
Brandenburg
University of Applied Sciences
Cottbus
Institute for
Security and Safety



NRD Cyber Security

ITU Academy
Empowering minds



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OVERVIEW OF CoE INITIATIVE

The Centres of Excellence (CoE) programme was launched by the International Telecommunication Union (ITU) in 2000, aiming to support capacity building in the field of information and communication technologies (ICTs). Designed to offer continuous education to ICT professionals and executives in the public and private spheres through face-to-face or distance learning programmes, the Centres serve as regional focal points for professional development, research, and knowledge sharing, as well as provide specialist training services to external clients. With the support from multilateral and regional organizations, CoE networks have been established in all ITU regions. The current network is composed of 31 Centres across the globe, six each in Africa, the Americas, Arab States and Asia-Pacific regions, five in the Europe region and three in the CIS region.

CENTRE OF EXCELLENCE FOR EUROPE

The second cycle of the new Centre of Excellence programme started in January 2019 and will end in December 2022. A total of 31 institutions were selected to operate as Centres of Excellence during this period. The following institutions were selected in Europe to provide trainings in particular six priority areas.

	Name of Institution	Country	Priority areas
	A. S. Popov Odessa National Academy of Telecommunications (ONAT)	Ukraine	Wireless & Fixed Broadband Digital Broadcasting
	Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje (FEEIT)	North Macedonia	Wireless & Fixed Broadband
	Institute for Security and Safety (ISS) at the Brandenburg University of Applied Sciences	Germany	Cybersecurity
	National Institute of Telecommunications (NIT)	Poland	Internet Governance Wireless & Fixed Broadband
	NRD Cyber Security (NRD CS)	Lithuania	Cybersecurity
	The Abdus Salam International Centre for Theoretical Physics (ICTP)	Italy	Internet of Things Big Data & Statistics

SCOPE

This catalogue has been produced by the ITU Office for Europe in collaboration with five ITU Centres of Excellence in Europe to highlight and promote the capacity building courses provided by the centres.

While participation is open to participants from all countries, stakeholders from the Member States of the Europe region (as defined at ITU) are primarily encouraged to participate in the courses. These countries are Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Georgia, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, North Macedonia, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Vatican City State and the United Kingdom.

The courses aim to increase participants' understanding, knowledge and awareness in the following areas:

- Wireless & fixed broadband
- Digital broadcasting
- Cybersecurity
- Internet governance
- Big data & statistics
- Internet of things

Courses are provided either face to face or online - via the ITU Academy e-learning platform.

All courses have a test component. A certificate of achievement is given to candidates who successfully complete the end-of-course assessment(s).

Information on the registration process and payment methods can be found on the ITU Academy website: academy.itu.int

Changes in course dates may occur and are reflected on the ITU Academy website: academy.itu.int

TRAININGS OFFERED BY ITU CoEs FOR EUROPE

In 2019 the ITU Centres of Excellence for Europe is offering 21 trainings. Two different kind of courses are provided. **Face-to-face** courses (in blue) and **online courses** (in purple). Trainings are presented in chronological order.

NO	TRAINING COURSE TOPIC	COE	DATES	VENUE	TRAINING FEE	TYPE OF TRAINING
1	Strategic Aspects for Internet Governance and Innovations	NIT	4-11 March	Online	150 USD	Online
2	Wireless Access Technologies to Internet Network	NIT	8-15 April	Online	150 USD	Online
3	Cybersecurity Techniques	ISS	May-December	Online: Self-paced	250 USD	Online
4	Governing Cyber Security at the National Level: Best practices and lessons learned	NRD CS	7-10 May	Vilnius, Lithuania	800 USD	Face-to-face
5	Building broadband telemedicine networks and providing e-health services at the local, regional and national levels	ONAT	16-17 May	Odessa, Ukraine	150 USD	Face-to-face
7	Legal and regulatory barriers to the introduction of cloud services in the EU	NIT	20-27 May	Online	150 USD	Online
6	Features of 5G technology implementation at the local (some towns), regional (district, region) and national level	ONAT	23-24 May	Odessa, Ukraine	150 USD	Face-to-face
8	NGN Evolution, Future Networks and Ultra-broadband Internet	FEEIT	28 May – 24 June	Online	150 USD	Online
9	Cyber Incident Response (Self-Paced Course)	ISS	June-December	Online: Self-paced	250 USD	Online
10	CODATA/RDA Research Data Science Summer School	ICTP	12-16 August	Trieste, Italy	500 USD	Face-to-face
11	CODATA/RDA Advanced Workshop on IoT and Big-Data Analytics	ICTP	19-23 August	Trieste Italy	500 USD	Face-to-face
12	Security and QoS in Internet Network	NIT	26 August-2 September	Online	150 USD	Online
13	Technical Aspects of Wireless Solutions for the Internet of Things (IoT)	ICTP	2-4 September	Trieste, Italy	500 USD	Face-to-face
14	Incident Response Practice: Hands-on scenario-based training	NRD CS	17-20 September	Vilnius, Lithuania	800 USD	Face-to-face
15	Technical, business and regulatory aspects of 5G Networks	NIT	30 September 7 October	Online	150 USD	Online
16	Automation of broadband networks designing. Selecting the most appropriate solutions to build network	ONAT	October	Ashgabat, Turkmenistan	Free (in Russian)	Face-to-face
17	QoS Technologies and Regulation for Fixed and Mobile	NIT	24-25 October	Warsaw, Poland	500 USD	Face-to-face
18	IoT Entrepreneurship	ICTP	6-8 November	Trieste, Italy	500 USD	Face-to-face
19	The use of adaptive technologies to transmit video over radio channels	ONAT	7-8 November	Odessa, Ukraine	Free (in Russian)	Face-to-face
20	CODATA/RDA/ICTP/TWAS Research Data Science Summer School in West Africa	ICTP	18-22 November	Nigeria	300 USD	Face-to-face
21	Wireless and Mobile Ultra-broadband: LTE-A PRO, WLAN, and 5G NR	FEEIT	19 November 16 December	Online	150 USD	Online

STRATEGIC ASPECTS FOR INTERNET GOVERNANCE AND INNOVATIONS

| 4 - 11 March 2019 |

ORGANISED BY



National Institute
of Telecommunications

LANGAGE

English

FEES

150 USD

MODE

Online

DURATION

8 days

REGISTRATION DEADLINE

4 March 2019

COURSE CODE

19OI24209EUR-E

The course aims at presenting the current process of innovations in Internet from strategic, political, technological and business perspective of view. The course will cover 10 key topics:

- Convergence in Telecommunications toward Internet
- Broadband Strategies and Innovations
- Internet Standardization and Policy
- Innovation management in ICT
- Google model vs. Apple model
- Mobile and Internet telephony
- IPTV innovations
- Innovative services and applications
- Network neutrality
- Management and regulation of Internet

Audience:

The course is addressed to corporate executives and managers, policy makers, regulators, i.e. middle-level managers, administrators, officials and engineers dealing with planning, developing, implementing and managing current and future telecom networks.

Trainer:

Prof. Dr Toni Janevski

WIRELESS ACCESS TECHNOLOGIES TO INTERNET NETWORK

| 8 - 15 April 2019 |

ORGANISED BY



LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

8 days

REGISTRATION DEADLINE

8 April 2019

COURSE CODE

190I24242EUR-E

Course aims at presenting the key aspects of the current most important wireless access technologies to this Internet world. The course will cover 10 key topics:

- Wireless and Mobile Internet fundamentals
- 4G access technologies by 3GPP: LTE/LTE-Advanced
- Evolved Packet Core (EPC) for mobile Internet network
- 4G access technologies by IEEE: Mobile WiMAX
- WiFi access technologies: IEEE 802.11n/ac/ad
- QoS in wireless and mobile networks
- 4G 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.

Audience:

The course is addressed to corporate executives and managers, policy makers, regulators, i.e. middle-level managers, administrators, officials and engineers dealing with planning, developing, implementing and managing current and future telecom networks.

Trainer:

Prof. Dr Toni Janevski

CYBERSECURITY TECHNIQUES

| May - December 2019 |

ORGANISED BY



LANGUAGE

English

FEES

250 USD

MODE

Online: Self-Paced

DURATION

/

REGISTRATION DEADLINE

NONE

COURSE CODE

19OS24333EUR-E

The course will provide theoretical and practical knowledge of IT and cyber security and security methods for computer, network and electronic communication. Intensive practical exercises will support the theoretical lectures.

Main modules include the following:

- Computer security and access control
- Authentication and cryptography
- Computer security architecture
- Network security
- Intrusion detection and information recovery
- Network management practice

Upon the successful completion of this course, students will be able to explain and give examples of IT and cyber security and use computer and communication security measures. They will be able to apply different intrusion detection methods and establish network management practice.

Audience:

The course is addressed to people working in the cyber field who want to extend their knowledge in cyber security on a technical level. IT knowledge is a prerequisite.

GOVERNING CYBER SECURITY AT THE NATIONAL LEVEL: Best practices and lessons learned

| 7 - 10 May 2019 |

Vilnius, LITHUANIA

ORGANISED BY



LANGUAGE

English

FEES

800 USD

MODE

Face-to-face

DURATION

4 days

REGISTRATION DEADLINE

23 April 2019 (if entry
visa is not requested)

COURSE CODE

19WS24216EUR-E

For most of the national cyber security initiatives to be effective and successful, the key stakeholders must possess strong cybersecurity governance skills. The course is focused on building these skills via theoretical and practical knowledge transfer from field experts.

The training will deliver insights regarding the best cyber security governance practices at the national level, including methodical, practical and lessons learned. All teaching material is based on illustrative real-life cases and their analysis will be delivered using lectures, case studies, roundtable and group play methods. In addition, the participants will benefit from two site visits - one to the Digital Government facility and another to the state of the art Tier4 data center.

During the training, national cyber security topic will be addressed from different levels and perspectives, such as national and international, intelligence, military, governmental, international and local businesses and citizens. Participants will have the opportunity to discuss the most important issues of governing a national cyber security strategy with experienced worldwide experts. The discussions will cover vital matters such as enablers as well as essential drivers and elements for the national cyber security strategy, typical development path at the national level and its building blocks, lifecycle and supervision. The course will conclude by outlining the capabilities necessary for handling the national cyber incidents, possible solutions and recommendations how to manage it and practical considerations related to national cyber security.

Audience:

The course is designed for senior and top-level officials from state administration and governmental bodies which have a mandate for or are involved in establishing, developing, coordinating and implementing national cyber security strategy and other relevant initiatives. It is also of interest to anyone influencing cyber security initiatives at national level. Participants from all regions are welcomed.

BUILDING BROADBAND TELEMEDICINE NETWORKS AND PROVIDING E-HEALTH SERVICES AT THE LOCAL, REGIONAL AND NATIONAL LEVELS

| 16 - 17 May |

Odessa, UKRAINE



The purpose of the Workshop is to give to the participants the information on

- provision of medical services using telemedicine networks, including the processing of digital medical data, personalized medical-service records, the electronic outpatient card, the electronic patient health record, and so on.
- determining the optimal variant of building telemedicine networks at the local, regional and national levels, taking into account the specificity of the countries in the region.
- construction of telemedicine networks, including the selection of hardware and software, as well as its installation and configuration.

LANGUAGE

English

FEES

150 USD

MODE

Face-to-face

DURATION

2 days

REGISTRATION DEADLINE

May 16, 2019

COURSE CODE

19BD24330EUR-E

Audience:

This workshop is targeted at technical staff, engineers, senior and mid-level management staff of telemedicine and telehealth service providers, medical institutions, clinics and hospitals, for doctors, for medical students. It is also of interest to employees of ministries and government healthcare authorities dealing with the issues of telemedicine network development and providing e-Health services.

LEGAL AND REGULATORY BARRIERS TO THE INTRODUCTION OF CLOUD SERVICES IN THE EU

| 20 - 27 May 2019 |

ORGANISED BY
 **INSTYTUT ŁĄCZNOŚCI**
PAŃSTWOWY INSTYTUT BADAWCZY
National Institute
of Telecommunications

LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

8 days

REGISTRATION DEADLINE

20 May 2019

COURSE CODE

190I24243EUR-E

The course will cover 10 key topics:

- Cloud computing - phenomenon
- Sources of law relating to cloud computing
- The role of standardization in the development and provision of security measures aimed at protecting services offered in the cloud
- Different types of information as the subject matter of services delivered in the cloud
- The role of participants in cloud computing contracts and its legal aspects
- Legal and regulatory burdens related to the provision of services in the cloud
- Auditing the cloud - the aim, scope, results and benefits of an audit
- Enforcement of contracts for the provision of services in the cloud
- Access to cloud services and access barriers
- Application of cloud services to the local and state government

Audience:

The course is in particular addressed to: members of IT teams, sales and legal departments considering the procurement of cloud solutions, regulators, (in house) lawyers and anyone interested in cloud services.

Trainer:

Dr Andrzej Krasuski

FEATURES OF 5G TECHNOLOGY IMPLEMENTATION AT THE LOCAL (SOME TOWNS), REGIONAL (DISTRICT, REGION) AND NATIONAL LEVEL

| 23 - 24 May 2019 |

Odessa, UKRAINE



The purpose of the Workshop is to give to the participants the information on modern and perspective technologies for mobile communications and broadband access. The Workshop will allow participants in future personally to assist introduction and development of 5G mobile communication and broadband access networks.

After the Workshop, participants will have an understanding of:

- main radio interfaces of 5G
- technologies used at the 5G physical layer, in particular the technical data, the frequency bands, spectral efficiency and the main technologies used at the physical layer
- principles of implementation of the 5G physical layer, in particular formation and processing of broadband signals; principles of 5G network implementation, in particular network architecture
- principles of the frequency planning for 5G networks, in particular of the radio channel models for 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
- further evolution of 5G networks

LANGUAGE

English

FEES

150 USD

MODE

Face-to-face

DURATION

2 days

REGISTRATION DEADLINE

May 23, 2019

COURSE CODE

19WS24331EUR-E

Audience:

This workshop is targeted at technical staff, engineers, senior and mid-level management staff of telecommunications service providers, telecommunication and broadcasting companies. It is also of interest to employees of Telecommunication Authorities dealing with the issues of broadband network development, audio and multimedia broadcasting.

NGN EVOLUTION, FUTURE NETWORKS AND ULTRA-BROADBAND INTERNET

| 28 May - 24 June 2019 |

ORGANISED BY



LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

4 weeks

REGISTRATION DEADLINE

27 May 2019

COURSE CODE

190I24244EUR-E

This course will focus on NGN Evolution, Future Networks and Ultra-Broadband Internet from technology, regulation and business aspects. It will cover the Internet fundamentals, including Internet architectures (client-server, peer-to-peer), protocols (IPv4, IPv6, TCP, UDP), IPv4 and IPv6 addressing, DNS, Internet networking (unicast, multicast), WWW services (Web 2.0, Web 3.0), Internet traffic management and QoS, as well as strategic Internet governance.

Further, the course will include ITU's Next Generation Networks (NGN), NGN evolution (NGNe), Future Networks, Software Defined Networking (SDN), QoS for NGN and Future Networks, trusted environment in ICT infrastructures, as well as business and regulatory aspects of Future Networks and trusted ICT infrastructures.

Also, it will cover ITU's ultra-broadband xDSL access, cable access (DOCSIS 3.0/3.1), ITU's ultra-broadband optical access (G-PON, XG-PON, NG-PON2), QoS for fixed ultra-broadband access, Carrier Ethernet (Metro, Regional, Global), MPLS and VPN (Virtual Private Networks), SDN control of transport networks, end-to-end QoS, as well as strategic aspects for ultra-broadband on digital economy and society.

Finally, the course will incorporate NGN VoIP and IPTV, cloud edge and fog computing, Internet of Things (IoT) based on NGNe, Artificial Intelligence (AI) for ICTs, Big Data, Smart Sustainable Cities (SSC), OTT ultra-broadband services (2k/4k/8k video, AR/VR, voice, messaging, social networking), network neutrality, as well as business and regulatory aspects of ultra-broadband services in the digital era.

Audience:

This course is targeted at managers, engineers and employees from regulators, government organizations, telecommunication companies and academia, who are interested in understanding, implementation and regulation of NGN Evolution, Future Networks and Ultra-Broadband Internet, including technologies, standardization, regulation and content. Other institutions and individuals that are dedicated in building their capacity related to NGN Evolution, Future Networks and Ultra-Broadband Internet are also welcome to participate.

CYBER INCIDENT RESPONSE

| June - December 2019 |



LANGUAGE
English
FEES
250 USD
MODE
Online: Self-paced
DURATION
/
REGISTRATION DEADLINE
NONE
COURSE CODE
19OS24332EUR-E

The course will provide theoretical and practical knowledge of Cyber Incident Response activities, define their main goals and challenges, showing dominating roles in this process with responsibilities explained and make an emphasis on most important details of each Cyber Incident Response stage.

Main Modules of the Course include the following:

- Incident Response and Recovery Overview
- Preparedness and prevention
- Detection
- Analysis
- Containment
- Investigation
- Eradication and recovery
- Post-Incident Activity

Upon the successful completion of this course, students will be able to define and describe main steps taken in Cyber Incident Response, understand main roles and responsibilities in response process and how they are implemented in organization's Cyber Security Plan.

Audience:

The course is addressed to people working in the cyber field who want to extend their knowledge in incident response. The course is relevant for everybody who works in IT operation processes or who wants to become an incident responder. It also supports Information Security Management Systems (ISMS).

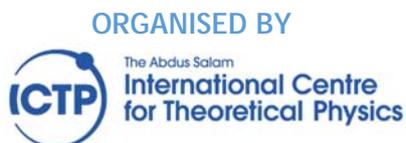
CODATA/RDA RESEARCH DATA SCIENCE SUMMER SCHOOL

| 12 - 16 August 2019 |

Trieste, ITALY

This course focuses on building a range of data related skills and competence in data analysis techniques for participants from all disciplines and/or backgrounds. Topics to be covered include

- Data visualization,
- Machine Learning,
- Artificial Neural Networks,
- High Throughput Computing (HTC) and
- Cloud Computing.



LANGUAGE

English

FEES

500 USD

MODE

Face-to-face

DURATION

5 days

REGISTRATION DEADLINE

June 12, 2019

COURSE CODE

19WS24307EUR-E

The activity includes practical hands-on sessions on techniques and applications for large-scale data handling, analysis, visualization and modeling on a variety of computer infrastructure including high performance computing platforms/systems.

Participants are expected to have a working knowledge of the Linux Operating System including using the command line environment as well as the basic level of programming in the R programming Language (via the Rstudio GUI). *Applicants who lack the expected background may arrive 1 week early and participate in a preparatory boot-camp activity aimed at developing R programming and Linux O.S. skills.*

Audience: The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Professionals and Scientists

Maximum of 10 participants

CODATA/RDA ADVANCED WORKSHOP ON IoT AND BIG-DATA ANALYTICS

| 19 - 23 August 2019 |

Trieste, ITALY

ORGANISED BY



LANGUAGE

English

FEES

500 USD

MODE

Face-to-face

DURATION

5 days

REGISTRATION DEADLINE

July 19, 2019

COURSE CODE

19WS24310EUR-E

This hands-on workshop activity covers advanced use of Big Data Analysis tools. Topics to be covered include:

- Big-Data tools and technology
- Real-time event processing and Low-latency query
- Customer sentiment analysis including social media

The practical hands-on sessions include deploying and using Big-Data-Analytic tools and platforms such as Hadoop, Apache Kafka and HDF.

Participants are expected to have a working knowledge of fundamentals of IoT Data collection from sensors, the Linux Operating System including using the command line environment as well as good level of programming in the R programming Language.

Audience: The training course is designed for:

- Electrical engineers
- Telecommunications engineers

Maximum of 10 participants

SECURITY AND QoS IN INTERNET NETWORK

| 26 August - 2 September 2019 |

ORGANISED BY



National Institute
of Telecommunications

LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

8 days

REGISTRATION DEADLINE

26 August 2019

COURSE CODE

190I24246EUR-E

This course will focus on Security and Quality of Service (QoS) in Internet network from technology, regulation and business aspects. The course will cover 10 key topics:

- Internet fundamentals
- Internet security by IETF
- ITU's security architectures providing end-to-end communications
- Cybersecurity
- Cloud computing and Internet of Things (IoT) security
- Internet QoS
- QoS parameters
- QoS for data and mobile broadband services
- Network neutrality and Internet KPIs measurements
- ITU guidelines for QoS regulation.

Audience:

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

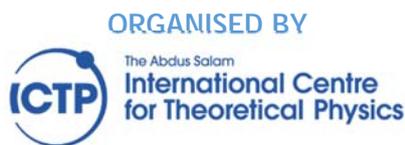
Trainer:

Prof. Dr Toni Janevski

TECHNICAL ASPECTS OF WIRELESS SOLUTIONS FOR THE INTERNET OF THINGS (IoT)

| 2 - 4 September 2019 |

Trieste, ITALY



LANGUAGE

English

FEES

500 USD

MODE

Face-to-face

DURATION

3 days

REGISTRATION DEADLINE

28 July 2019

COURSE CODE

19WS24311EUR-E

There is general consensus that IoT has enormous potential to deliver great impact on the economy and on society at large. Having a good grasp of the relevant technical aspects is a must for bringing this to fruition. This capacity building course aims to provide the audience with a better technical understanding of wireless solutions for IoT. Participants will be exposed to the general aspects of IoT networks and will then dive into specifics of LPWAN and cellular solutions tailored to IoT like LTE-M and NB-IoT. Practical examples of IoT wireless technologies will be demonstrated.

Audience: The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Computer scientists
- Regulators
- Telecom Operators
- Networks Operators

INCIDENT RESPONSE PRACTICE: Hands-on scenario-based training

| 17 - 20 September 2019 |

Vilnius, LITHUANIA

ORGANISED BY



NRD Cyber Security

LANGUAGE

English

FEES

800 USD

MODE

Face-to-face

DURATION

4 days

REGISTRATION DEADLINE

30 August 2019 (if entry
visa is not requested)

COURSE CODE

19WS24302EUR-E

For the efforts towards strengthening cyber security to be successful, technical teams must be specifically trained on practicalities of incident response. The course is designed to empower incident handlers to be effective at their work.

Data breaches are everywhere, and they're showing no signs of slowing down. Internal and external threats pose big risks to all types of organizations, only the damage and recovery time could be different. The training is dedicated to measure the readiness of CSIRT to deal with the most often real-world cases of cyber security incidents. The course is composed of series of exercises by providing participants with questionnaires and practical assignments on specific types of cyber security incidents.

The training is led by prominent experts who are on daily basis involved in CSIRT related activities at national and organizational level in Lithuania and abroad.

Participants will be provided a set of specific pre-defined real-life incident scenarios. Several different incident handling cases are simulated to students and focused on incident detection and description, information gathering, analysis tools and techniques and incident handling phases by using RTIR (or related) tool. Cyber threat hunting tips are also provided to deeper knowledge in incident handling.

During hands-on exercises, participants will work with the following topics:

- Incident management key components;
- Information sources available, such as zone-h, shodan, pastebin, host and network logs;
- E-mail incidents investigation;
- Network logs-based incidents investigation;
- Host logs-based incidents investigation.

Audience:

The course is designed for CIRT members and all incident handlers who wish to be effective at their work.

Requirement:

During that course, participants are required to bring a laptop with them.

TECHNICAL, BUSINESS AND REGULATORY ASPECTS OF 5G NETWORKS

| 30 September - 7 October 2019 |

ORGANISED BY



LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

8 days

REGISTRATION DEADLINE

30 September 2019

COURSE CODE

190I24247EUR-E

This course will focus on technical, business and regulatory aspects of the 5G mobile networks. The course will cover 10 key topics:

- Mobile broadband evolution
- LTE-Advanced-Pro: transition from 4G toward 5G mobile networks
- 5G network architecture: network slicing
- 5G New Radio access
- 5G Next Generation core network
- 5G services: mobile ultra-broadband and ultra-reliable low latency services
- Massive Internet of Things (IoT) and IPv6 in 5G
- 5G Quality of Service (QoS)
- Business aspects of 5G networks and services
- 5G/IMT spectrum management and regulation

Audience:

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 technical, business and regulatory aspects of 5G network, including technologies, standardization, regulation and content. Other institutions and individuals that are dedicated in building their capacity related to technical, business and regulatory aspects of 5G network are also welcome to participate.

Trainer:

Prof. Dr Toni Janevski

AUTOMATION OF BROADBAND NETWORKS DESIGNING: Selecting the most appropriate solutions to build network

| October - Coming soon |

Ashgabat, TURKMENISTAN



LANGUAGE

Russian

FEES

Free

MODE

Face-to-face

DURATION

1 Day

REGISTRATION DEADLINE

October 9, 2019

COURSE CODE

19WS24312EUR-E

This training aims to introduce participants to modern methods of telecommunication network designing and the principles of its automation. It is focused on the aspects of broadband networks designing. Automated selection of the most appropriate solutions to build network using the Broadband Calculator online tool is considered. The training will allow participants to contribute personally to the implementation and development of telecommunication networks in future.

Audience:

This training is targeted at technical staff, engineering staff of telecommunication providing companies, telecommunications and broadcasting companies. The training can also be of interest to employees of Telecommunication Authorities of countries dealing with the issues of broadband network development.

QoS TECHNOLOGIES AND REGULATION FOR FIXED AND MOBILE NETWORKS

| 24 - 25 October 2019 |

Warsaw, POLAND

ORGANISED BY
 **INSTYTUT ŁĄCZNOŚCI**
PAŃSTWOWY INSTYTUT BADAWCZY
National Institute
of Telecommunications

LANGUAGE

English

FEES

500 USD

MODE

Face-to-face

DURATION

2 days

REGISTRATION DEADLINE

23 October 2019

COURSE CODE

19WS24298EUR-E

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 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). The course includes interconnection and its QoS aspects. Further, it covers generic and specific QoS parameters, KPIs (Key Performance Indicators) and their measurements. The course also covers network neutrality and its regulation. The course includes QoS regulatory framework based on technical, business/economic and regulatory principles of QoS for services over fixed and mobile networks.

Audience:

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.

Trainer:

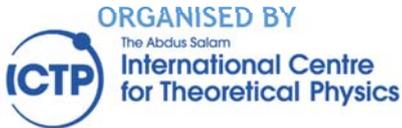
Prof. Dr. Toni Janevski

INTERNET OF THINGS (IoT) ENTREPRENEURSHIP

| 6 - 8 November 2019 |

Trieste, ITALY

The rise of Internet of Things (IoT) has many names, including The Next Industrial Revolution and Industry 4.0. As with any emerging technology, entrepreneurs worldwide are impatient to build IoT businesses. While every company's IoT product offerings will differ, there are some basic items that must be addressed in order to build a successful IoT business. This capacity building course will introduce the general entrepreneurship concepts and will then focus on IoT business models and user cases.



LANGUAGE

English

FEES

500 USD

MODE

Face-to-face

DURATION

3 days

REGISTRATION DEADLINE

30 September 2019

COURSE CODE

19WS24313EUR-E

Audience: The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Computer scientists
- Regulators
- Telecom Operators
- Networks Operators

THE USE OF ADAPTIVE TECHNOLOGIES TO TRANSMIT VIDEO OVER RADIO CHANNELS

| 7 - 8 November |

Odessa, UKRAINE



LANGUAGE

Russian

FEES

Free

MODE

Face-to-face

DURATION

2 days

REGISTRATION DEADLINE

November 7, 2019

COURSE CODE

19WS24314EUR-E

Audience:

This training is targeted at designers of digital broadcasting and wireless telecommunications systems in a variety of environments.

The training will be also useful for specialists engaged in:

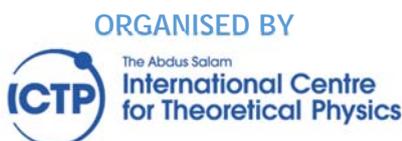
- provision of high-quality communication in urban terrain and high-quality color reproduction in various shooting and playback conditions
- designing antenna systems and improving them by applying adaptive technologies
- acoustic design of premises and provision of spatial sound in broadcasting systems
- introduction of new systems of visual information compression.

Also, the training may be of interest for the staff of organizations, enterprises and institutions dealing with the development of adaptive wireless communication systems, transmission of video content and information.

CODATA/RDA/ICTP/TWAS Research Data Science Summer School in West Africa

| 18 - 22 November 2019 |

Abuja, Nigeria



LANGUAGE

English

FEES

300 USD

MODE

Face-to-face

DURATION

5 days

REGISTRATION DEADLINE

20 October 2019

COURSE CODE

19WS24315EUR-E

This course focuses on building a range of data related skills and competence in data analysis techniques for participants from all disciplines and/or backgrounds. Topics to be covered include

- Data visualization,
- Machine Learning,
- Artificial Neural Networks,
- High Throughput Computing (HTC) and
- Cloud Computing.

The activity includes practical hands-on sessions on techniques and applications for large-scale data handling, analysis, visualization and modeling on a variety of computer infrastructure including high performance computing platforms/systems.

Audience: The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Professionals and Scientists
- Regulators
- Telecom Operators
- Networks Operators

Participants are expected to have a working knowledge of the Linux Operating System including using the command line environment as well as the R programming Language (via the Rstudio GUI). Applicants who lack the expected background may arrive 1 week early and participate in a preparatory boot-camp activity aimed at developing R programming and Linux O.S. skills.

WIRELESS AND MOBILE ULTRA-BROADBAND: LTE-A PRO, WLAN, AND 5G NR

| 19 November - 16 December 2019 |

ORGANISED BY



LANGUAGE

English

FEES

150 USD

MODE

Online

DURATION

4 weeks

REGISTRATION DEADLINE

18 November 2019

COURSE CODE

19OI24245EUR-E

This course will focus on Wireless and Mobile Ultra Broadband Internet - LTE-A Pro, WLAN and 5G NR, from technology, regulation and business aspects. It will cover mobile broadband technologies, including mobile and Internet convergence, ITU's role in mobile broadband Internet, 4G LTE, LTE-A (4.5G), LTE-A Pro (4.9G), mobile Internet of Things (IoT) architectures, QoS in 4G/4.5G/4.9G mobile networks, ITU spectrum management, as well as business and regulation aspects of mobile broadband.

Further, the course will include ultra-broadband WLAN, including architectures, ultra-broadband WLAN standards (IEEE 802.11 ac/ad), Next Generation WLAN (IEEE 802.11x), WLAN for Internet of Things (IoT), mobile traffic offload over WLAN, as well as regulation and business aspects of ultra-broadband WLAN.

Also, it will cover 5G mobile ultra-broadband, including ITU's IMT-2020, 5G network architectures, network slicing, 5G New Radio (NR), 5G Next Generation Core (NG Core), Mobile Edge Computing (MEC), QoS in 5G, ITU WRC-2019 and 5G spectrum allocations, as well as business and regulation aspects for 5G mobile ultra-broadband.

Finally, the course will incorporate mobile ultra-broadband services, including Voice over LTE (VoLTE), Voice over 5G NR (VoNR), mobile TV and video over 4G/5G, enhanced Mobile Broadband (eMBB), Ultra-Reliable Low-Latency Communication (URLLC), massive Machine Type Communication (mMTC), Virtual Reality (AR) and Augmented Reality (AR), network neutrality vs. QoS as well as regulation and business aspects for mobile ultra-broadband services.

Audience:

This course is targeted at managers, engineers and employees from regulators, government organizations, telecommunication companies and academia, who are interested in understanding, implementation and regulation of wireless and mobile ultra-broadband (LTE-A Pro, WLAN, and 5G NR), including technologies, standardization, regulation and content. Other institutions and individuals that are dedicated in building their capacity related to wireless and mobile ultra-broadband (LTE-A Pro, WLAN, and 5G NR) are also welcome to participate.

The centres of excellence (CoE) programme was launched by the International Telecommunication Union (ITU) at the turn of the millennium, aiming to support capacity building in the field of information and communication technologies (ICTs). Designed to offer continuous education to ICT professionals and executives in the public and private spheres through face-to-face or distance learning programmes, the Centres serve as regional focal points for professional development, research, and knowledge sharing, as well as provide specialist training services to external clients. With the support from multilateral and regional organizations, CoE networks have been established in a number of regions including Africa, the Americas, Arab States, Asia-Pacific, Commonwealth of Independent States (CIS) and Europe. The 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.

Mr Vladislav Kumysh

Chief of R&D Department

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

Ukraine

vlad.kumysh@onat.edu.ua

Priority areas:

Wireless & Fixed Broadband and Digital Broadcasting

Prof Dr Toni Janevski

Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University in Skopje (FEEIT)

North Macedonia

tonij@feit.ukim.edu.mk

Priority area: Wireless & Fixed Broadband

Dr Sylwester Laskowski

National Institute of Telecommunications (NIT)

Poland

S.Laskowski@itl.waw.pl

Priority areas:

Internet Governance and Wireless & Fixed Broadband



Ms Ruta Jasinskiene

Head of Training

NRD Cyber Security

Lithuania

rj@nrdfs.lt

Priority areas: Cybersecurity

Dr Marco Zennaro

Research Officer T/ICT4 Lab

The Abdus Salam International Centre for Theoretical Physics (ICTP)

Italy

mzennaro@ictp.it

Priority areas:

Mr Marco Macori

Research Fellow

Institute for Security and Safety (ISS) at the Brandenburg University of Applied Sciences

Germany

macori@th-brandenburg.de

Priority areas: Cybersecurity

