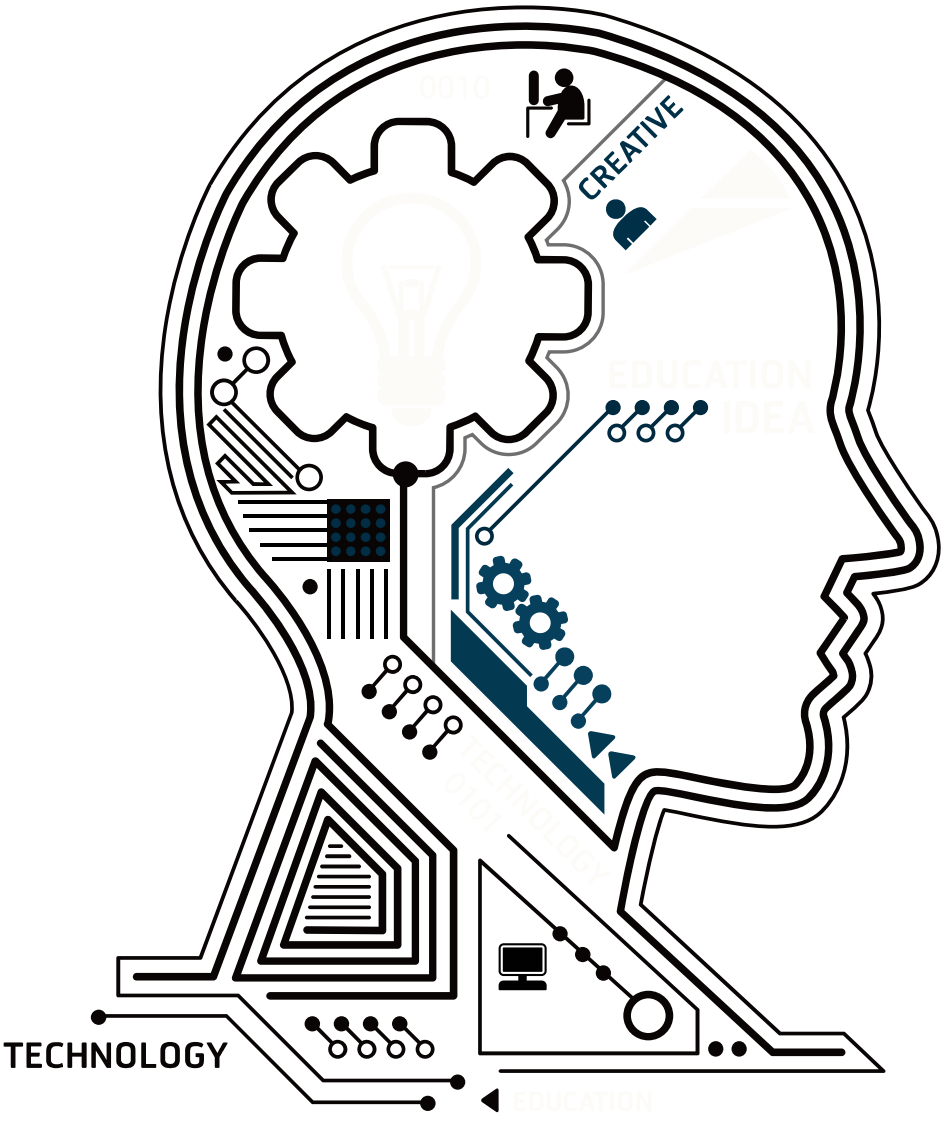
ITU Centres of Excellence for Europe

# Training opportunities

2022




The Abdus Salam International Centre for Theoretical Physics

National Institute of Telecommunications

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

NRD Cyber Security

ITUAcademy
Empowering minds

Table of Content

# OVERVIEW OF CoE INITIATIVE

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 ICTs. Designed to offer continuous education to ICT professionals and executives in the public and private spheres, 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 29 Centres across the globe, six each in the Africa and Europe regions, five in the Americas and Asia & Pacific regions, four in the Arab region and one in the CIS region.

# CENTRES OF EXCELLENCE FOR EUROPE

The second cycle of the new Centres of Excellence programme started in January 2019 and will end in December 2022. A total of 29 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 |
|---|---|---|---|
| | Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University, Skopje (FEEIT) | North Macedonia | Wireless & Fixed Broadband |
| Technische Hochschule Brandenburg University of Applied Sciences Institute for Security and Safety | Institute for Security and Safety (ISS) at the Brandenburg University of Applied Sciences | Germany | Cybersecurity |
| National Institute of Telecommunications | National Institute of Telecommunications (NIT) | Poland | Internet Governance<br>Wireless & Fixed Broadband |
| NRD Cyber Security | NRD Cyber Security (NRD CS) | Lithuania | Cybersecurity |
| ICTP The Abdus Salam International Centre for Theoretical Physics | The Abdus Salam International Centre for Theoretical Physics (ICTP) | Italy | Internet of Things<br>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 applicants 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 knowledge and awareness in the participants' following areas:

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

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 2022 the ITU Centres of Excellence for Europe is offering 21 trainings. Three different kind of courses are provided. Face-to-face courses (in blue), online courses (in yellow), self-paced courses (in green). Trainings are presented in chronological order with online and self-paced courses presented first, followed by all face-to-face courses. **Please note that due to the Covid-19 Pandemic, the information in this catalogue is subject to change as the situation in Europe and the greater world continues to evolve.*

| NO. | Training course topic | CoE | Dates | Venue | Training fee | Type of training |
|---|---|---|---|---|---|---|
| 1. | INFORMATION SECURITY MANAGEMENT SYSTEM | ISS | 15 Jan – 31 Dec | Online | 249 USD | Self-paced |
| 2. | CYBER INCIDENT RESPONSE | ISS | 15 Jan – 31 Dec | Online | 249 USD | Self-paced |
| 3. | CYBER RISK MANAGEMENT | ISS | 15 Jan – 31 Dec | Online | 249 USD | Self-paced |
| 4. | CYBERSECURITY TECHNIQUES | ISS | 15 Jan – 31 Dec | Online | 249 USD | Self-paced |
| 5. | INTRODUCTION TO DATA CLASSIFICATION AND INFORMATION PROTECTION | ICTP | 1-28 Feb | Online | 150 USD | Online |
| 6. | STRATEGIC ASPECTS FOR INTERNET GOVERNANCE AND INNOVATIONS | NIT | 3 – 10 Feb | Online | 150 USD | Online |
| 7. | WIRELESS ACCESS TECHNOLOGIES TO INTERNET NETWORK | NIT | 4-14 March | Online | 150 USD | Online |
| 8. | CSIRT/SOC ESTABLISHMENT AND MODERNISATION | NRD-CS | 14-17 March | Online | 800 USD | Online |
| 9. | INTRODUCTION TO DATA PROTECTION AND CYBER HYGIENE | ICTP | 3-29 April | Online | 150 USD | Online |
| 10. | SECURITY AND QOS IN INTERNET NETWORK | NIT | 11-18 April | Online | 150 USD | Online |
| 11. | NEW BROADBAND INTERNET, CLOUD COMPUTING, IOT/AI AND FUTURE SERVICES | FEEIT | 31 May – 27 June | Online | 150 USD | Online |
| 12. | DATA SECURITY CHALLENGES IN THE NEW NORMAL | ICTP | 4-30 June | Online | 150 USD | Online |
| 13. | LEGAL, REGULATORY AND TECHNICAL ASPECTS OF CLOUD COMPUTING IN INTERNATIONAL DATA TRANSFERS | NIT | 13-20 June | Online | 150 USD | Online |
| 14. | AN INTRODUCTION TO TINYML | ICTP | 13-15 June | Online | 150 USD | Online |
| 15. | INTRODUCTION TO RESEARCH DATA SCIENCE | ICTP | 1-26 August | Online | 150 USD | Online |
| 16. | TECHNICAL, BUSINESS AND REGULATORY ASPECTS OF 5G NETWORK | NIT | 22-29 August | Online | 150 USD | Online |

| | | | | | | |
|---|---|---|---|---|---|---|
| 17. | QOS TECHNOLOGIES AND REGULATION FOR FIXED AND MOBILE | NIT | 26 September – 3 October | Online | 150 USD | Online |
| 18. | HANDS-ON SCENARIO-BASED TRAINING INCIDENT RESPONSE PRACTICE | NRD-CS | 7-10 November | Online | 800 USD | Online |
| 19. | 5G-ADVANCED MOBILE BROADBAND INTERNET AND NEW SERVICES | FEEIT | 22 November - 19 December | Online | 150 USD | Online |
| 20. | LEGAL ASPECTS OF ARTIFICIAL INTELLIGENCE IN BUSINESS, HOUSEHOLD AND PUBLIC SECTOR | NIT | 5-12 December | Online | 150 USD | Online |
| 21. | KEY ASPECTS AND GOVERNANCE OF INTERNET OF THINGS, BIG DATA AND ARTIFICIAL INTELLIGENCE | NIT | 27-28 October | Warsaw, Poland | 500 USD | Face to Face |

# INFORMATION SECURITY MANAGEMENT SYSTEM

## | 15 January – 31 December 2022 |

**ORGANISED BY**

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

**LANGUAGE**

English

**FEES**

249 USD

**MODE**

Self-paced

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

No deadline

**COURSE CODE**

22OS28023EUR-E

**Description:**

This web-based training gives a comprehensive overview on how to implement information security management system (ISMS). With the completion of this training, learners will have a deep understanding of the benefits of an ISMS, and the knowledge on how to plan and implement an ISMS all by themselves. They will be able to integrate the ISMS in the management structure of a company or organization in connection with other management systems. Finally, they will be able to prepare their company or organization to meet the requirements to successfully complete a certification audit according to ISO 27001. This training is designed to meet the needs of anyone who wishes to ensure a high level of information security, be it because he wants to offer digital goods or services, to protect his own assets, to offer his customers the best possible protection, or because he is obliged by regulations to comply with information security. The training offers an introduction as well as a thorough overview for anyone involved with information security, i. e. members of the top-level management of companies and organizations as well as prospective security officers and anyone responsible for security issues from the perspective of regulators, IT, and business processes. **While the course dates are open until December, participants are expected to finalize the course within 3 months.

**Audience:**

The course is designed for managers, engineers,employees from regulators, government, private companies and academia, who want to further their cybersecurity career or extend their expertise in cybersecurity topics.

**Trainer:**

Dmytro Cherkashyn

# CYBER INCIDENT RESPONSE

## |15 January - 31 December 2022 |

**ORGANISED BY**

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

**LANGUAGE**

English

**FEES**

249 USD

**MODE**

Self-paced

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

No deadline

**COURSE CODE**

22OS28025EUR-E

**Description:**

The course will provide students with all necessary knowledge of cyber incident response activities, what are main goals and challenges, and explaining main roles and responsibilities in such important process.
They will get most up to date trends in this area with an emphasis on most important details of each cyber incident response stage.
Upon the successful completion of this course, students will be able take a part in development and implementation of cyber incident plan.
Students will have three months to complete the course. After this time, registrations will be reopened for new participants.

**Audience:**

Security engineers, computer security specialists, computer incident response plan participants, line managers, security consultants.

**Trainer:**

Dmytro Cherkashyn

# CYBER RISK MANAGEMENT

## | 15 January - 31 December 2022 |

**ORGANISED BY**

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

**LANGUAGE**

English

**FEES**

249 USD

**MODE**

Self-paced

**DURATION**

-

**REGISTRATION DEADLINE**

No deadline

**COURSE CODE**

22OS28026EUR-E

**Description:**

This course aims to provide a student with an understanding of risk management processes according to ISO 27000 and ISO 31000. The content will cover such topics as risk assessment and risk management as a core process for an ISMS, risk handling, and mitigation strategies. Besides that, a general introduction to emergency operation planning, crisis management, and cyber-insurance subjects will be provided.
Students will have three months to complete the course. After this time, registrations will be reopened for new participants.

**Audience**

Professionals with information security responsibilities, managers, ISO, CISO.

**Trainers:**

Dmytro Cherkashyn, Swantje Westpfahl

# CYBERSECURITY TECHNIQUES

## | 15 January - 31 December 2022 |

**ORGANISED BY**

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

**LANGUAGE**

English

**FEES**

249 USD

**MODE**

Self-paced

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

No deadline

**COURSE CODE**

22OS28028EUR-E

**Description:**

This online course will provide theoretical and practical knowledge of IT and cyber security and security methods for computer, network, and electronic communication. The course consists of various chapters and will cover fundamentals, such as IT versus ICS, threats and their sources, authentication, computer access control, cryptography, network security, network firewall concepts, intrusion detection. The student will get a comprehensive view on security in the cyber space. The course will be a self-studying course with a Q&A session (video conference) near the end of the course. While the course dates are open until December, participants are expected to finalize the course within 3 months

**Audience:**

The course is designed to be a great value for managers, engineers and employees from regulators, government organizations, private companies and academia, who want to get further career in the cybersecurity area or need to extend their expertise with cybersecurity related topics.

**Trainer:**

Dmytro Cherkashyn

# INTRODUCTION TO DATA CLASSIFICATION AND INFORMATION PROTECTION

## | 1-28 February 2022 |

**ORGANISED BY**

The Abdus Salam International Centre for Theoretical Physics

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

15 January 2022

**COURSE CODE**

22OI27798EUR-E

Information protection requires a planned investment of digital defence systems. However, the value of data plays a crucial role in determining the level of such protection that must be accorded. This course introduces the concept of value-based classification of data, and how data categorization determines the scope and nature of protection deployed. It offers an understanding of information protection techniques applied to various categories of data used in industry, business, government, academia, and the corporate world. The course highlights real-life use cases of data classification.

**Audience:**

The course is designed for everyone who accesses, uses, manages, or processes any type of digital data in everyday personal, commercial or industrial use, including but not limited to, freelance computer users, bloggers, science scholars, data scientists and managers, business executives, technology students, researchers, information management officers, information technology professionals, cyber security experts, industry professionals, online marketers, eCommerce practitioners and operators, etc.

**Trainer:**
Kenneth Okereafor, PhD

# STRATEGIC ASPECTS FOR INTERNET GOVERNANCE AND INNOVATIONS

## | 3-10 February 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

2 February 2022

**COURSE CODE**

22OI27801EUR-E

**Description:**

The strategic aspects of Internet governance and innovation, technology, regulatory and business aspects are covered in this course. The transition of telecom networks and services to all-IP networks has been completed almost everywhere in the first two decades of the 21st century. Such convergence in telecom towards IP networks and services and use of Internet technologies is driven by the development of broadband across the globe. This is targeted mainly to Internet access service and this course covers the Internet standardization and policy. Network neutrality in Internet provides basis for speedy innovations in telecom/ICTs via the so-called OTT services. The course includes mobile QoS-enabled voice, based on NGN and IMS (IP Multimedia Subsystem), and Internet telephony. It continues with IPTV innovation, including IMS-based IPTV, mobile TV (evolved MBMS), and OTT television. The course covers innovative services and applications on Internet, network neutrality for open Internet, as well as regulatory issues related to IP/Internet governance.

**Audience:**

The course targets corporate executives, managers, policy makers, regulators,middle-level managers, administrators, officials, engineers dealing with planning, development, implementation and management of current and future IP/Internet networks. Other institutions and individuals that are dedicated in building their capacity related to Strategic Aspects for Internet Governance and Innovations are welcome to participate.

**Trainer:**

Prof. Dr. Toni Janevski

# WIRELESS ACCESS TECHNOLOGIES TO INTERNET NETWORK

## | 4-14 March 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

11 days

**REGISTRATION DEADLINE**

3 March 2022

**COURSE CODE**

22OI27802EUR-E

**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.

**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

# CSIRT/SOC ESTABLISHMENT AND MODERNISATION

## | 14 – 17 March 2022 |

**ORGANISED BY**

NRD Cyber Security

**LANGUAGE**

English

**FEES**

800 USD

**MODE**

Online

**DURATION**

4 days

**REGISTRATION DEADLINE**

14 March 2022

**COURSE CODE**

22OI27683EUR-E

**Description:**

The course dives deep into CSIRT/SOC establishment practice, where combination of theory, unique experience with lessons learned, and hands-on practice give attendees a clear and actionable picture on how to build an effective cybersecurity team. This training helps to successively prepare for cybersecurity team establishment and answers the main questions raised before starting:

1. How to build an effective cybersecurity team? Overview, discussion, and practice about a mandate, governance, team and its structure, timeline, lessons learned from similar establishments, financial planning.
2. What services in addition to incident management to introduce and how? Applied mandatory and complimentary services, best international practice for services models, incident management, incident management workflows and variations.
3. What technology is behind it? Scrutiny of principal architecture for CSIRT stack, integrations and managerial (not technical) look into technologies, automation vs manual, and technology trends.
4. How to mature security services and when? Elaboration of KPIs, SLAs and related metrics, security briefings, weekly/monthly/quarterly/yearly reports, analysis of examples and exercises on how to plan improvements for security services provided.
5. What is the baseline for it? Presentation of best international models measuring the maturity of cybersecurity team and its various components, advice on how to use them and how they help in operational environment.

**Audience:**

The training is designed for non-technical professionals who are (or will be) responsible for cybersecurity teams (CSIRT/CERT/SOC) establishment, management and growth in governmental and private sectors. Such leader must possess strong understanding about the purposes,

requirements, duties and effective performance of the unit and be able to implement it in practice.

**Trainer:**

Vilius Benetis, CSIRT/SOC architect, cybersecurity incident handling expert, researcher practitioner, CEO of NRD Cyber Security

# INTRODUCTION TO DATA PROTECTION AND CYBER HYGIENE

## | 3-29 April 2022 |

**ORGANISED BY**

The Abdus Salam International Centre for Theoretical Physics

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

15 March 2022

**COURSE CODE**

22OI27803EUR-E

Digital data is exposed to various types of threats while traversing data networks across a wide range of platforms. Understanding the types of threats to which data is exposed is as important as understanding how to protect data from vulnerable systems. This course introduces important concepts in maintaining cyber hygiene and preserving data integrity in the cyberspace.

**Audience:**

The course is designed for everyone who accesses, uses, manages, or processes any type of digital data in everyday personal, commercial or industrial use, including but not limited to, freelance computer users, bloggers, science scholars, data scientists and managers, business executives, technology students, researchers, information management officers, information technology professionals, cyber security experts, industry professionals, online marketers, eCommerce practitioners and operators, etc.

**Trainer:**
Kenneth Okereafor, PhD

# SECURITY AND QOS IN INTERNET NETWORK

## | 11-18 April 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

11 April 2022

**COURSE CODE**

22OS27804EUR-E

**Description:**

This course will focus on Security and Quality of Service (QoS) in Internet network from technology, regulation and business aspects. It will cover Internet fundamentals, including Internet protocols and architectures, Internet security standards and approaches as defined by IETF (Internet Engineering Task For architectures for end-to-end communications. Further, the course will incorporate cybersecurity approaches from the ITU viewpoint, and security aspects of emerging cloud computing and Internet of Things (IoT). Further, the course will incorporate Internet QoS, including the standardized solutions and practical approaches for provision of end-to-end QoS. In that manner it will cover QoS parameters as defined by the ITU and QoS for data (i.e., Over-The-Top services) and mobile services. Finally, the course will include network neutrality, Internet KPIs (Key Performance Indicators) and their measurements.

**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

# NEW BROADBAND INTERNET, CLOUD COMPUTING, IOT/AI AND FUTURE SERVICES

## | 31 May - 27 June 2022 |

**ORGANISED BY**

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

30 May 2022

**COURSE CODE**

22OI27815EUR-E

This course will focus on Future Broadband: Ultra-broadband Internet, Clouds, IoT and Artificial Intelligence, including technologies, regulation and business aspects. It will cover Internet technologies, including IPv6, DNS, DHCP, IP networking, HTTP 2.0, IPX, IP QoS, Cybersecurity, as well as Internet governance. Also, it will include MPLS/VPN transport, Carrier Ethernet, as well as future gigabit copper, fiber optic, submarine cable, and satellite broadband access. Further, it will cover SDN and network virtualization (NFV) for fixe Computing architectures, security and privacy, future OTT and telecom clouds (Machine Learning as a Service, Blockchain as a Service), clouds governance, uses of Artificial Intelligence (AI) for Internet and telecoms, as well as critical and massive IoT, data management, Big Data architectures, as well as IoT/data security, privacy and trust. Finally, it will also cover future broadband OTT services (video, social, AR/VR/XR, Web 3.0) and net neutrality, Tactile Internet for remote operations (TIRO), Intelligent operation network (ION), Digital twins (DT), Space-terrestrial integrated network (STIN), Industry 4.0, smart city as well as future clouds/IoT/AI services, including their business and regulatory aspects.

**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 Future Broadband: Ultra-broadband Internet, Clouds, IoT and Artificial Intelligence, including technologies, regulatory and business aspects. Other institutions and individuals that are dedicated in building their capacity related to Future Broadband: Ultra-broadband Internet, Clouds, IoT and Artificial Intelligence are also welcome to participate.

**Trainer:** Prof. Dr. Toni Janevski, Dr. Marko Porjazoski, Dr. Tomislav Shuminoski

# DATA SECURITY CHALLENGES IN THE NEW NORMAL

## | 4-30 June 2022 |

**ORGANISED BY**

The Abdus Salam International Centre for Theoretical Physics

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

15 May 2022

**COURSE CODE**

22OI27805EUR-E

**Description:**

The COVID-19 pandemic has led to the global reliance on the digital domain for various transactions. The global adoption of online alternatives has also resulted in fresh data security challenges, as well as significant increase in the number and sophistication of cyberattacks. Understanding the techniques to tackle data breaches is essential to preventing fatal consequences. This course teaches how to mitigate post-COVID data security challenges in the corporate world.

**Audience:**

The course is designed for everyone who accesses, uses, manages, or processes any type of digital data in everyday personal, commercial or industrial use, including but not limited to, freelance computer users, bloggers, science scholars, data scientists and managers, business executives, technology students, researchers, information management officers, information technology professionals, cyber security experts, industry professionals, online marketers, eCommerce practitioners and operators, etc.

**Trainer:**

Kenneth Okereafor, PhD

# AN INTRODUCTION TO TINYML

## | 13-15 June 2022 |

**ORGANISED BY**

The Abdus Salam International Centre for Theoretical Physics

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

3 days

**REGISTRATION DEADLINE**

1 June 2022

**COURSE CODE**

22OI27806EUR-E

**Description:**

Machine Learning (ML) has a huge potential to tackle societal issues in diverse fields including agriculture, conservation, and healthcare. TinyML is a cutting-edge field that brings the transformative power of machine learning (ML) to small low-power and low-cost computing devices. The advent of TinyML

offers new opportunities for complex on-device ML applications and research. With their low power requirements, TinyML devices can be widely deployed to positively impact society.

**Audience:**

The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Computer scientists

**Trainer:**
Marco Zennaro, ICTP and Marcelo José Rovai, UNIFEI (Universidade Federal de Itajubá)

# LEGAL, REGULATORY AND TECHNICAL ASPECTS OF CLOUD COMPUTING IN INTERNATIONAL DATA TRANSFERS

## | 13-20 June 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

13 June 2022

**COURSE CODE**

22OI27807EUR-E

**Description:**

The subject matter in this web seminar refers to international data transfers whereby cloud computing solutions will be applied. In relation to the subject matter various types of data will be discussed, including personal, which will be analysed in the context of different regulations. The web seminar will include technical aspects of application of various types of the cloud computing and its impact on the application of the legal framework. The seminar will also address different roles of cloud actors and its obligations under relevant regulations. In addition, the seminar will discuss liability issues for providing cloud services in an international dimension. At the outset of the seminar a knowledge test will be conducted. The seminar will include regulatory aspects of the use of cloud computing, including regulatory control issues.

**Audience:**

The target group of this workshop include representatives of regulatory bodies, dealing with cloud computing matters, telecommunications issues, consumer protection issues, cyber security issues, data protection issues.

**Trainer:**

Dr hab. Andrzej Krasuski

# INTRODUCTION TO RESEARCH DATA SCIENCE

## | 1-26 August 2022 |

**ORGANISED BY**

The Abdus Salam International Centre for Theoretical Physics

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

15 July 2022

**COURSE CODE**

22OI27808EUR-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.

**Audience:**

The course is designed for anyone who needs to analyse large amounts of data for research and other purposes.

**Trainer:**
Clement Onime, Solomon Gizaw

# TECHNICAL, BUSINESS AND REGULATORY ASPECTS OF 5G NETWORKS

## | 22-29 August 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

22 August 2022

**COURSE CODE**

22OS27809EUR-E

**Description:**

This course will focus on technical, business and regulatory aspects of the 5G mobile networks. It will include 4G mobile technology transition toward the 5G, considering the access and core networks as well as end-user services. Mobile broadband Internet after 4G will continue with the next generation, 5G, so the course will cover also IPv6 and its impact on 5G mobile networks. Further, it will include M2M (Machine-to-Machine) and mobile Internet of Things (IoT) services are foreseen types in future 5G mobile environments, as well as mobile cloud computing implementations. Also, the course will include spectrum management for IMT (International Mobile Telecommunications) including the 5G considerations. The QoS in mobile networks going from 3G/4G mobile world toward the 5G will continue to be important, hence the course will also focus on QoS and QoE in next generation mobile environments. Finally, the course will focus on emerging services and applications in 5G mobile networks in different verticals, including technology, as well as their business and regulation aspects.

**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

# QoS TECHNOLOGIES AND REGULATION FOR FIXED AND MOBILE

## | 26 September – 3 October 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

26 September 2022

**COURSE CODE**

22OI27810EUR-E-E

**Description:**

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.

**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

# HANDS-ON SCENARIO-BASED TRAINING INCIDENT RESPONSE PRACTICE

## | 7-10 November 2022 |

**ORGANISED BY**

NRD Cyber Security

**LANGUAGE**

English

**FEES**

800 USD

**MODE**

Online

**DURATION**

4 days

**REGISTRATION DEADLINE**

4 November 2022

**COURSE CODE**

22OI27811EUR-E

**Description:**

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. The training course presents a comprehensive overview of cybersecurity teams' issues vulnerability handling, trend/technology watch, security tools, and also issues of artefact handling and forensics. The course is technical in nature, relying heavily on hands-on and practical experience. The most recent threats and vulnerabilities are treated. The training is dedicated to measure the readiness of CSIRT to deal with the most often real-world cases of cyber hands-on scenario-based training 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. 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

**Audience:**

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

**Trainer:**

**Marius Urkis,** NRD CIRT lead, **Rimtautas Černiauskas** technical cyber security consultant and investigator, Dr. **Vilius Benetis**, CSIRT/SOC architect, cybersecurity incident handling expert, researcher practitioner, Director at NRD Cyber Security

# 5G-ADVANCED MOBILE BROADBAND INTERNET AND NEW SERVICES

## | 22 November - 19 December 2022 |

**ORGANISED BY**

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

4 weeks

**REGISTRATION DEADLINE**

21 November 2022

**COURSE CODE**

22OS27814EUR-E

**Description:**

This course will focus on 5G-Advanced Mobile Broadband Internet and New Services, including technologies, regulation and business aspects. Module 1 will cover the Set of Radio Interface Technologies (SRITs) for use with 5G RAN in NSA (Non Stand-Alone) deployments. In that respect, Module 1 will include 4G/4.9G (LTE/LTE-Advanced-Pro) and its Evolved Packet System (EPS), QoS, QoE and KPIs for mobile Internet, then NB-IoT (Narrow-Band Internet of Things) and eMTC (enhanced Machine Type Communication), LTE in unlicensed bands, spectrum management, as well as business and regulatory aspects of mobile broadband. Further, the course will target 5G Stand-Alone (5G SA) solution. In that manner, Module 2 covers 5G New Radio (NR), 5G Core (5GC) and Software-Based Architecture (SBA), transition from 4G to 5G, network slicing, edge computing in the 5G Core, QoS and slicing QoE in 5G. It will also include transport network solutions for 5G, such as ITU Network), ITU's spect, as well as 5G business and regulatory aspects. Then, Module 3 will provide the future development of mobile broadband, including 5G-Advanced enhancements, Integrated Access and Backhaul (IAB), AI (Artificial Intelligence)/ML (Machine Learning) use cases in 5G-Advanced, interworking of 5G and future WLAN (WiFi 6 i.e. IEEE 802.11ax, and WiFi 7 i.e. IEEE 802.11be). In addition, Module 3 will include NTN (Non-Terrestrial Networks)/Satellite evolution including NR and IoT, 5G FWA (Fixed-Wireless Access), 5G/5G-Advanced private (non-public) networks for new services, as well as business and regulatory aspects of future mobile broadband. Last module, Module 4, will target new services in 5G and 5G-Advanced mobile networks. So, Module 4 will cover new 5G voice services (Voice over NR - VoNR, EPS Fallback), evolution of 5G multicast and broadcast services, 5G XR (eXtended Reality) with QoS and application awareness, and evolved Mobile Broadband (eMBB) for mobile Internet access and OTT (Over The Top) services. Finally, Module 4 will also include massive Machine Type Communication (mMTC)/IoT services, Ultra-

Reliable and Low-Latency Communication (URLLC) for Industrial IoT over NR, Vehicular to Everything (V2X), new 5G services vs. Internet network neutrality, as well as business and regulatory aspects for new 5G-Advanced 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 5G-Advanced Mobile Broadband Internet and New Services, including technologies, regulatory and business aspects. Other institutions and individuals that are dedicated in building their capacity related to 5G-Advanced Mobile Broadband Internet and New Services.

**Trainer:**
Prof. Dr. Toni Janevski, Dr. Pero Latkoski, Dr. Tomislav Shuminoski

# LEGAL ASPECTS OF ARTIFICIAL INTELLIGENCE IN BUSINESS, HOUSEHOLD AND PUBLIC SECTOR

## | 5-12 December 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

150 USD

**MODE**

Online

**DURATION**

8 days

**REGISTRATION DEADLINE**

5 December 2022

**COURSE CODE**

22OS27812EUR-E

**Description:**

The subject matter of this stationary workshop is the discussion of legal framework applicable to Artificial Intelligence with international focus. By discussing the application of Artificial Intelligence, various types of Artificial Agents in many spheres of life will be considered, including: business activity, household, and the public sector. During the workshop different definitions of Artificial Intelligence will be considered and discussed from a legal point of view. The workshop will also encompass liability issues connected with the use of Artificial Intelligence, including robots. Various concepts of liability will be assessed. During the workshop various examples of the application of Artificial Intelligence will be included. In addition, recommendations for future legislation will be presented and analysed. At the outset of the workshop a knowledge test will be conducted.

**Audience:**

The target group of this workshop include representatives of regulatory bodies, dealing specifically with Artificial Intelligence issues, but also with consumer protection issues, cyber security issues, data protection issues.

**Trainer:**

Dr hab. Andrzej Krasuski

# KEY ASPECTS AND GOVERNANCE OF INTERNET OF THINGS, BIG DATA AND ARTIFICIAL INTELLIGENCE

## | 27-28 October 2022 |

**ORGANISED BY**

National Institute of Telecommunications

**LANGUAGE**

English

**FEES**

500 USD

**MODE**

Face to face

**DURATION**

2 days

**REGISTRATION DEADLINE**

27 October 2022

**COURSE CODE**

22WS27813EUR-E

**Description:**

This course will focus on technical, business and regulatory aspects of Internet of Things (IoT), Big Data and Artificial Intelligence (AI). It will cover Internet technologies for IoT, then IoT standards, architectures and interoperability, as well as IoT policies and regulations, including IoT security and privacy issues. The course will include IoT services in 4G and 5G mobile systems, including massive IoT and critical IoT use cases. The IoT generates large amounts of data that cannot be processed by traditional techniques, and such data is referred to as Big Data. In that manner, the course will include Big Data overview, Big Data ecosystem and reference architecture, Big Data technologies and use cases, as well as business and regulatory challenges for Big Data. Artificial Intelligence (AI) is targeted for processing Big Data in Internet and telecom networks. In that regard the course will cover introduction to AI in ICT/telecom world, and AI applications in Internet and telecom worlds, including Machine Learning aspects for 5G mobile networks. The course will further include Big Data and AI challenges, business aspects, as well as policies and regulation. Finally, the course will cover Internet governance with regard to IoT, Big Data, and AI.

**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 Internet of Things (IoT), Big Data and Artificial Intelligence (AI), including technical, business and regulatory aspects. Other institutions and individuals that are dedicated in building their capacity related to IoT, Big Data and AI, including technical, business and regulatory aspects, are also welcome to participate.

**Trainer:** Prof. Dr. Toni Janevski

**Prof Dr Toni Janevski**
Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University in Skopje (FEEIT)
North Macedonia
Email: tonij@feit.ukim.edu.mk
Priority area:

- Wireless & Fixed Broadband

**Dr Sylwester Laskowski**
National Institute of Telecommunications (NIT)
Poland
Email: S.Laskowski@itl.waw.pl
Priority areas:

- Internet Governance
- Wireless & Fixed Broadband

**Ms Ruta Jasinskiene**
Head of Training
NRD Cyber Security
Lithuania
Email: rj@nrdcs.lt
Priority areas:

- Cybersecurity

**Mr Dmytro Charkashyn**
Research Fellow
Institute for Security and Safety (ISS) at the Brandenburg University of Applied Sciences
Germany
Email: macori@th-brandenburg.de

Priority areas:

- Cybersecurity

**Dr Marco Zennaro**
Research OfficerT/ICT4 Lab
The Abdus Salam International Centre for Theoretical Physics (ICTP)
Italy
Email: mzennaro@ictp.it
Priority areas:

- Internet of Things
- Big Data & Statistics

**ITU Office for Europe**
**International Telecommunication Union (ITU)**
Place des Nations, 1211 Geneva 20
Switzerland
https://www.itu.int/en/ITU-D/RegionalPresence/Europe/Pages/default.aspx
Email: EURregion@itu.int
Phone: +41 22 730 5743