**ITU Centres of Excellence Network for Asia and the Pacific**

**State Radio Monitoring Center - China**

**Online Training Course on**

## SPECTRUM MANAGEMENT AND RADIO FREQUENCY (RF) MONITORING

**17 – 28 August 2020**

## COURSE OUTLINE

## COURSE DESCRIPTION

| Title | Spectrum Management and Radio Frequency (RF) Monitoring |
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| Objectives | This online training course aims to introduce participants to concepts of spectrum management and RF monitoring and will focus on following key areas:<br><br>(1) Outcomes of WRC-19<br>(2) Introduction of ITU-R WP1C activities<br>(3) Satellite monitoring<br>(4) Advanced RF Monitoring (5G NR, UAVs)<br>(5) Monitoring Data Acquisition and Processing |
| Dates | 17 – 28 August 2020 |
| Duration | 2 weeks |
| Registration deadline | 16 August 2020 |
| Training fees | Free |
| Course code | **20OI24878ASP-E** |

## LEARNING OUTCOMES

This course covers the core functions of spectrum management and RF monitoring and is mainly targeted towards the staff of National Spectrum Management agencies. Inclusive of the detailed case studies from China, the course consists of detailed sessions on topics of World Radio Conferences, Satellite and advanced RF monitoring etc. amongst others.

The training course will provide an empowering learning environment through a combination of course content and discussion boards focused on sharing information with the participants.

## TARGET POPULATION

This training is designed to address mid to senior level management from policy makers, regulators, corporate executives and managers responsible for Spectrum Management and RF monitoring.

## TUTORS/INSTRUCTORS

| NAME OF TUTOR(S)/INSTRUCTOR(S) | Organization |
|---|---|
| Aamir Riaz | ITU |
| Ms. LUO Chao | SRMC |
| Mr. HAO Caiyong | SRMC |
| Mr. ZHENG Gaozhe | SRMC |
| Mr. MA Zijian | SRMC |
| Mr. NIU Gang | Beijing XNBB Technology Co., Ltd. |
| Mr. LIU xiaopu | Rohde & Schwarz |

## EVALUATION

Below are the evaluation schemes:

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| Quiz #1: | 20% |
| Quiz #2 | 40% |
| Participation | 20% |
| Assignment | 20% |
| **Total Evaluation:** | **100%** |

**Important:  For issuance of certificates, a minimum of 60% is necessary**

## TRAINING SCHEDULE AND CONTENTS

| Topic | Speaker | Interactive Session |
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| **Outcomes of WRC-19**<br><br>*World Radio Conferences (WRC) play a vital role in international spectrum management and harmonized use of Radio resources. The last WRC was held in Nov 2019 in Sharm ul Sheikh – Egypt and had reached very important decisions on making more spectrum available for future IMT2020 networks amongst others. The content under this item would discuss these results.* | ITU – RO-ASP | 18th August 2020 |
| **Study activities in ITU-R WP1C**<br><br>*The presentation will introduce the study achievements and hotspots of ITU-R Working Party 1C in recent years.* | SRMC<br><br>Ms. LUO Chao | 19th August 2020 |
| **Satellite monitoring and interference geolocation: development and challenges**<br><br>*The presentation will introduce the development and challenges of satellite monitoring and interference geolocation, especially under the current situation of the NGSO satellite constellation. Traditional satellite monitoring methods and technologies may not be able to cope with the development of satellite communications, so some potential satellite monitoring methods will be investigated.* | SRMC<br><br>Mr. HAO Caiyong | 21st August 2020 |
| **Quiz #1** | | 21st August 2020 |
| **Monitoring Techniques Based on Radio Sensor**<br><br>*The presentation will introduce the radio sensor equipment, including TDOA, RSS, complex method and each application scenario. For TDOA method, introduce its hyperbolic equation solution, time delay estimation method,* error link analysis. *Introduce some practical cases.* | SRMC<br><br>Mr. ZHENG Gaozhe | 24th August 2020 |
| **Civil UAVs monitoring techniques**<br><br>*Introduction to the monitoring techniques on civil unmanned aerial vehicles (UAVs), including technical characteristics of UAVs, signal analysis, radiolcation of operator, as well as countermeasure to the illegal use of UAVs* | SRMC<br><br>Mr. MA Zijian | 25th August 2020 |
| **Data Acquisition and Processing Technology Based on Internet + Radio Sensor**<br><br>*The presentation will introduce the concept of Internet + radio sensor and the application of software radio, edge computing, cloud computing, artificial intelligence and other technologies in the process of radio data Acquisition and processing.* | Beijing XNBB Technology Co., Ltd.<br><br>Mr. NIU Gang | 26th August 2020 |

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| **5G NR Downlink Signal OTA Measurement in the field**<br><br>*This training involves relevant content related to over the air (OTA) measurement on 5G new air (NR) downlink signal, introduction of technical background and technical problems, detailed description of measurement methods and case analysis* | Rhodes & Schwarz<br><br>Mr. LIU Xiaopu | 28th August 2020 |
| **Quiz #2** | | 28th August 2020 |

## METHODOLOGY

The training methodology will be as follows:

- Each module will be studied and discussed over the established time period;
- Training materials will be made available through online learning access page;
- Moderated Interactive discussion forums (60 mins with 15 mins for summary of relevant content and 45 mins for Q&A) will be organized where students are highly encouraged to participate and interact with instructors and other students;
- Quiz tests will be assigned at the end of a given training week;

All announcements for all events (materials, quizzes and forums) will be given prior to the event by the training tutor.

## COURSE COORDINATION

| **SRMC Focal point:**<br>Ms. LI Jianxin<br>Tel: +86 10 6800 9073<br>Fax: +86 10 6800 9073<br>E-mail: lijianxin@srrc.org.cn | **ITU coordinator:**<br>Mr. Aamir Riaz<br>Tel. +62 21 380 2321 / 380 2324<br>Fax +62 21 3890 5521<br>E-mail: aamir.riaz@itu.int |
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## REGISTRATION

**ITU Academy portal account**

Registration should be made online at the ITU Academy portal.

To be able to register for the course you **MUST** first create an account in the ITU Academy portal at the following address:

https://academy.itu.int/index.php/user/register

**Course registration**

When you have an existing account or created a new account, you can register for the course online at the following link: https://academy.itu.int/training-courses/full-catalogue/spectrum-management-and-radio-frequency-rf-monitoring


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