



Spectrum Management Training Programme

Online Training on SMTP EM1.1 Spectrum Monitoring 14 June-9 July 2021

TRAINING COURSE OUTLINE

COURSE DESCRIPTION

Title	SMTP EM1.1 Spectrum Monitoring
Method of delivery	Online
Objectives	After completion of this course, the student should be capable of clearly describing the role, functions and basic techniques of spectrum monitoring, and have an understanding of the purpose and capabilities of different types of spectrum monitoring equipment. Furthermore, the student should be able to demonstrate his/her ability to define monitoring tasks (check lists) and analyze their results (results list), as well as individually planning essential spectrum monitoring operations and measurements.
Dates	14 June-9 July 2021
Duration	4 weeks
Registration deadline	13 June 2021
Training fees	USD 200
Course code	21OI26641MUL-E
Course Domains	<ol style="list-style-type: none">1. ITU and its organs2. Regulatory Frameworks3. History of Radio communication4. Computer Aided Spectrum Management
Reference	<ol style="list-style-type: none">1. ITU Handbook on Spectrum Monitoring2. ITU Handbook on National Spectrum Management3. ITU Radio Regulations

DESCRIPTION OF THE TRAINING COURSE

The course covers the role, functions and basic techniques of spectrum monitoring, and purpose and capabilities of different types of spectrum monitoring equipment.

LEARNING OUTCOMES

- Participants will acquire skills to utilize automated spectrum skills for management of radio frequency spectrum.
- Participants will learn how to post radio frequencies in NTFAs and MIFR,
- They will learn how to conduct Authorization and licensing using automated SMS4DC tools.
- Participants will acquire knowledge on use of relational database management system and GIS for Spectrum management.
- They will acquire understanding of key elements and functional blocks of an automated spectrum management and monitoring system.
- They will acquire skills and abilities to compare and select a suitable spectrum management and monitoring system based on the needs of administrations.
- They will acquire skills to implement spectrum management systems in their respective administrations.

TARGET POPULATION

This course is targeted at engineers and officers tasked with planning, engineering, monitoring and operation of radio systems in developing and leased developed countries. Participants will be drawn from national regulatory authorities, fixed and mobile operators, broadcasters, service providers, government, military, security agencies, Aeronautical, maritime, meteorological, PMR Radio operators, Science and academia.

ENTRY REQUIREMENTS

No prior knowledge or qualification in Spectrum Monitoring is required, however it is important for participants to be working for a regulator, or in the ICT/Telecoms sector as a provider or consultant. Students in the Engineering or ICT related courses could also be considered.

TUTORS/INSTRUCTORS

NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Eng. Jared Baraza	nyakwarodenge@gmail.com Tel: +254719596054
Mr. Jonathan Mwakijele	Jmwakijele@afralti.org Tel: +254718860897

TRAINING COURSE CONTENTS

The topics covered in this module are:

1. Purpose and Role of monitoring in the spectrum management process
2. ITU's role and structure, with focus on ITU-R, Study Group SG1 and its Working Party 1C in particular
3. Radio Regulations, with focus on various articles related to monitoring
4. Typical measurements conducted by monitoring, such as:
 - Occupancy measurements

- Bandwidth measurements
 - Field strength measurements
 - Modulation measurements
 - Frequency measurements
5. ITU-R Recommendations and Reports related to monitoring
6. Principles of various types of monitoring equipment (manuals):
- Antennas
 - Receivers
 - Direction finders
 - Spectrum analysers

TRAINING COURSE SCHEDULE

Week / Session	Topic	Exercises and Interactions
Week 1 Purpose and role of Spectrum Monitoring in the Spectrum Management process and the role of ITU.	<ul style="list-style-type: none"> • Purpose and Role of monitoring in the spectrum management process. • ITU's role and structure, with focus on ITU-R, Study Group SG1 and its Working Party 1C in particular. • Radio Regulations, with focus on various articles related to monitoring. • ITU-R Recommendations and Reports related to monitoring 	<p>Forum 1: Why is Spectrum Monitoring important in your country and what roles does it play in overall frequency usage by operators and service providers?</p> <p>Forum 2: Why are Radio Regulations important and how are they used by your monitoring team to ensure compliance with all the clauses of the Regulations by Operators in your country?</p> <p>Exercise on the Monitoring Software</p> <p>Live Lecture and discussion: Wednesday, 1500 Hours-1700 Hours EAT</p> <p>Attempt Quiz 1</p>
Week 2 Typical measurements conducted by monitoring	<ul style="list-style-type: none"> • Occupancy measurements • Bandwidth measurements • Field strength measurements • Modulation measurements • Frequency measurements 	<p>Forum 3: Which measurements are carried out by your Spectrum Monitoring team and why are they important in terms of QoS and Spectrum efficiency?</p> <p>Exercise on the Spectrum Monitoring Software</p> <p>Live lecture and discussion: Wednesday, 1500 Hours-1700 Hours EAT</p> <p>Attempt Quiz 2</p>
Week 3 Principles of various types of monitoring equipment (manuals)	<ul style="list-style-type: none"> • Antennas • Receivers 	<p>Forum 4: How are Radio Regulations used in monitoring in your country?</p> <p>Exercise on the spectrum monitoring software</p> <p>Live lecture and discussions: Wednesday, 1500 Hours to 1700 Hours EAT</p> <p>Attempt Quiz 3</p>
Week 4 Principles of various types of monitoring equipment (manuals) (Cont.)	<ul style="list-style-type: none"> • Direction finders • Spectrum analysers 	<p>Forum 5: How are Radio Regulations used to reduce cases of harmful interference?</p> <p>Exercise on the Spectrum Monitoring Software</p> <p>Live Lecture and discussion: Wednesday, 1500 Hours-1700 Hours EAT</p>

		<p>Attempt Quiz 4</p> <p>End of course assignment: You have been nominated by your company to come up with a design and RFP for a new automated spectrum monitoring system. The system shall be integrated into the Spectrum management database and NTFA. Take into consideration ITU-T and ITU-R Regulations. Mention the important functions the system shall perform and the expected reports and output data.</p>
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METHODOLOGY (Didactic approach)

This course will be delivered using instructor-led online learning. The course is delivered using power-point slides posted on the course page and selected reference materials that the participants have to study each week, participate in scheduled activities and undertake self-assessments. Students will reinforce their understanding of the topics studied by drawing on their specific environments and are encouraged to consult with experienced colleagues who are working on a relevant topic. The following methods will be used for this course

- Self-study of PPTs and reference materials
- Instructor led presentations and discussions through ZOOM
- Forum discussions through the ITU Academy portal

EVALUATION AND GRADING

The evaluation is based on:

- Participation in all the four Forums (10%)
- Quiz week 1 (10%)
- Quiz week 2 (10%)
- Quiz week 3 (10%)
- Quiz week 4 (10%)
- End of course assignment (50%)

Participants should score an overall mark of 60% to get ITU Certificate.

TRAINING COORDINATION

<p>AFRALTI Coordinator:</p> <p>Jonathan P. Mwakijele Head of Management, Policy and Regulatory Unit African Advanced Level Telecommunications Institute (AFRALTI) Tel : +254 718 860 897 Email: Jmwakijele@afralti.org</p>	<p>ITU Coordinator:</p> <p>Emmanuel Niyikora Programme Officer ITU Area Office for West Africa, Dakar Tel : +250 788 312 939 Email: emmanuel.niyikora@itu.int</p>
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REGISTRATION AND PAYMENT

Registration on ITU Academy Portal

Registration and payment 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/sntp-em11-spectrum-monitoring-0>

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

Payment

1. On-line payment

A training fee of USD 200 per participant is applied for this training. Payment should be made via the online system using the link mentioned above for training registration.

2. Payment by bank transfer

Where it is not possible to make payment via the online system, select the option for offline payment to generate an invoice using the same link as above. Download the invoice to make a bank transfer to the ITU bank account shown below. Then send the proof of payment/copy of bank transfer slip and the invoice copy to Hcbmail@itu.int and copy the course coordinator. **All bank transaction fees must be borne by the payer.**

3. Group payment

Should you wish to pay for more than one participant using bank transfer and need one invoice for all of them, create an account as **Institutional Contact**. **Institutional Contacts** are users that represent an organization. Any student can request to be an institutional contact or to belong to any existing organization.

To do this, head to your profile page by clicking on the **“My account”** button in the user menu. At the bottom of this page you should see two buttons:

- a. If you want to **become an institutional contact**, click on the **“Apply to be an Institutional Contact”** button. This will redirect you to a small form that will ask for the organization name. After you fill the name of the organization you want to represent, click on **“continue”** and a request will be created. An ITU Academy manager will manually review this request and accept or deny it accordingly.
- b. If you want to **belong to an existing organization**, click on the **“Request to belong to an Institutional Contact”** button. This will redirect you to a small form that will ask you to select the organization you want to join from an organization list. After you select the correct organization, click on **“continue”**, a request will then be created. The Institutional Contact that represents that organization will manually accept or deny your request to join the organization.

Failure to submit the above documents may result in the applicant not being registered for the training.

ITU BANK ACCOUNT DETAILS:

Name and Address of Bank:	ITU BANK ACCOUNT DETAILS:
Name and Address of Bank:	UBS Switzerland AG Case postal 2600 CH 1211 Geneva 2 Switzerland
Beneficiary:	Union Internationale des Télécommunications
Account number:	240-C8108252.2 (USD)
Swift:	UBSWCHZH80A
IBAN	CH54 0024 0240 C810 8252 2
Amount:	USD 200
Payment Reference:	210I26641MUL-E - P.40635.1.01