



ITU Centres of Excellence Network for Africa
African Advanced Level Telecommunications Institute (AFRALTI)
Online Training Course on
Radio Frequency Spectrum Economy and Market Valuation
3 – 28 May 2021

COURSE OUTLINE

COURSE DESCRIPTION

Title	Radio Frequency Spectrum Economy and Market Valuation
Objectives	<p>This course demonstrates well economics of Radio Frequency (RF) spectrum as a resource by presenting contributions of the RF spectrum to economy of a country through auctions. The course also demonstrates well how the economic/market value of the Digital Dividend 1 (790-862MHz) and Digital Dividend (694-790MHz) can be calculated by Market Transaction Multiples Valuation Models and Discounted Cash Flow (DCF) Analysis Models.</p> <p>The objectives of the training course are to:</p> <ul style="list-style-type: none">• Understand the economics of the RF spectrum as the national asset• Understand how to estimate the market values for the Digital Dividend I (790-862MHz) and II (694-790MHz)• Understand how to design and conduct successfully the spectrum auction; and• Understand how to assign the pending Digital Dividends RF spectrum and others at Market Based Approach.
Dates	3-28 May 2021
Duration	20 Days
Registration deadline	2 May 2021
Training fees	USD960
Course code	21OI26453AFR-E

LEARNING OUTCOMES

After completing this course, the participant will be able to:

- Understand well the economics of the RF spectrum as the national asset;
- Estimate the market values for the Digital Dividend I (790-862MHz) and II (694-790MHz);
- Design and conduct successfully the spectrum auction; and
- Assign the pending Digital Dividends RF spectrum and others at Market Based Approach.

TARGET POPULATION

This training is targeted at personnel from regulators, mobile networks operators, economists and financial analysts involved in ICT sector, policy makers in the government and academia who are interested in understand well the economics of the RF Spectrum as the national asset.

TUTOR/INSTRUCTOR

NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Dr John Mpapalika	Email: mpapalikaj2016@gmail.com Tel: +255 762 545 228
Jonathan Mwakijele	Email: Jmwakijele@afraiti.org Tel: +254 718 860 897

EVALUATION

Centres of Excellence shall grant certificates of achievement based on assessment tests undertaken during, and at the end of, each training. In this regard, Centres of Excellence shall develop assessment tools for this training. The tools should include the following:

- Regular assessments quizzes

Only candidates who have successfully completed all the assessments quizzes shall be awarded the ITU certificate.

Training schedule and content (online training)

DAY	MODULE TITLE	TOPICS
1	Spectrum for Beginners	<ul style="list-style-type: none"> • Introduction to Radio Frequency Spectrum <ul style="list-style-type: none"> ○ Definition of Terms ○ Light Spectrum ○ Electromagnetic Spectrum ○ Electromagnetic Spectrum ○ Radio Waves ○ ITU Radio Frequency Bands ○ Propagation of Radio Waves
2	Spectrum for Beginners (cont.)	<ul style="list-style-type: none"> • Introduction to Radio Frequency Spectrum (Cont.) <ul style="list-style-type: none"> ○ Sweet Spot Combination of Propagation of Radio Waves ○ The Pot of Gold RF Spectrum ○ Allocation of the Pot of Gold RF Spectrum ○ ITU Regions of the World ○ Map of the ITU Regions for Allocations of the Radio Frequencies ○ Change of use of the VHF and UHF Radio Frequencies ○ ITU Terrestrial Analogy Television Broadcasting Frequency Plan ○ The Regional Radiocommunications Conferences
3	The RF Spectrum Economy	<ul style="list-style-type: none"> • Economics of Radio Frequency Spectrum as Resource
4	The RF Spectrum Economy (Cont.)	<ul style="list-style-type: none"> • Transition of Terrestrial Television Broadcasting from Analogue to Digital for Freeing Up Some Radio Frequency Spectrum As Digital Dividend
5	The RF Spectrum Economy (Cont.)	<ul style="list-style-type: none"> • Transition of Terrestrial Television Broadcasting from Analogue to Digital for Freeing Up Some Radio Frequency Spectrum As Digital Dividend (Cont.)
6	The RF Spectrum Valuation	<ul style="list-style-type: none"> • After-Tax Weighted Average Cost of Capital (After-Tax WACC) Applicable to Market Valuation of the Digital Dividend
7	The RF Spectrum Valuation (Cont.)	<ul style="list-style-type: none"> • After-Tax Weighted Average Cost of Capital (After-Tax WACC) Applicable to Market Valuation of the Digital Dividend (Cont.)

8	The RF Spectrum Valuation (Cont.)	<ul style="list-style-type: none"> After-Tax Weighted Average Cost of Capital (After-Tax WACC) Applicable to Market Valuation of the Digital Dividend (Cont.)
9	The RF Spectrum Valuation (Cont.)	<ul style="list-style-type: none"> After-Tax Weighted Average Cost of Capital (After-Tax WACC) Applicable to Market Valuation of the Digital Dividend (Cont.)
10	The RF Spectrum Valuation (Cont.)	<ul style="list-style-type: none"> After-Tax Weighted Average Cost of Capital (After-Tax WACC) Applicable to Market Valuation of the Digital Dividend (Cont.)
11	Case study of Digital Dividends	<ul style="list-style-type: none"> Channelisation and Radio Frequency Assignment Plan for the Digital Dividends
12	Case study of Digital Dividends (Cont.)	<ul style="list-style-type: none"> Channelisation and Radio Frequency Assignment Plan for the Digital Dividends (Cont.)
13	Case study of Digital Dividends (Cont.)	<ul style="list-style-type: none"> Channelisation and Radio Frequency Assignment Plan for the Digital Dividends (Cont.)
14	Case study of Digital Dividends (Cont.)	<ul style="list-style-type: none"> Channelisation and Radio Frequency Assignment Plan for the Digital Dividends (Cont.)
15	Case study of Digital Dividends (Cont.)	<ul style="list-style-type: none"> Channelisation and Radio Frequency Assignment Plan for the Digital Dividends (Cont.)
16	Spectrum Auctions	<ul style="list-style-type: none"> Market Transaction Multiples of Auctions of Digital Dividend 1 as a National Asset
17	Spectrum Auctions (Cont.)	<ul style="list-style-type: none"> Market Transaction Multiples of Auctions of Digital Dividend 1 as a National Asset (Cont.)
18	Spectrum Auctions (Cont.)	<ul style="list-style-type: none"> Market Transaction Multiples of Auctions of Digital Dividend 1 as a National Asset (Cont.)
19	Spectrum Auctions (Cont.)	<ul style="list-style-type: none"> Market Transaction Multiples of Auctions of Digital Dividend 1 as a National Asset (Cont.)
20	Summary and Conclusions	<ul style="list-style-type: none"> Summary of discussed topics and feedback from participants

METHODOLOGY

This course shall be conducted fully online. There will be Instructor led training, lectures, case studies and quizzes. All participants must do all the quizzes and pass in order to get a certificate from ITU. The tutor will deliver live lectures through ZOOM on every **Tuesday** and **Thursday** from **1100 Hours to 1300 Hours EAT/Nairobi Time (<https://time.is/Nairobi>)**. This will be opportunity for participants to interact directly with the tutor and ask questions and discuss different topics covered online in that week.

TRAINING SCHEDULES AND CONTENT AGENDA

WEEK	ACTIVITIES	EXERCISES AND QUIZ
WEEK 1	Read week 1 topics: Spectrum for Beginners <ul style="list-style-type: none"> Basic concepts of the RF spectrum for non-spectrum management engineers 	Do all quizzes

	<p>The RF Spectrum Economy</p> <ul style="list-style-type: none"> • Economics of the RF spectrum as a national asset • Growth in demand for the RF spectrum 	Participate in Forum 1 discussion
WEEK 2	<p>Read week 2 topics:</p> <p>The RF Spectrum Valuation</p> <ul style="list-style-type: none"> • The use of the DCF Valuation Models to estimate the maximum spectrum value, which is the full Enterprise Values. • The use of the Market Transaction Multiple Valuation Models to estimate the minimum spectrum value, which is the Reserve Price 	<p>Do all quizzes</p> <p>Participate in Forum 2 discussion</p>
WEEK 3	<p>Read week 3 topics:</p> <p>Case study of Digital Dividends</p> <ul style="list-style-type: none"> • Estimates of market values for Digital Dividend 1 (790-862Mhz) and Digital Dividend 11 (694-790MHz) for selected African countries 	<p>Do all quizzes</p> <p>Participate in Forum 3 discussion</p>
WEEK 4	<p>Read week 4 topics:</p> <p>Spectrum Auctions</p> <ul style="list-style-type: none"> • Different auction designs, features, types and formats that can be used to license the Digital Dividends and other competitive RF spectrum at market value. 	<p>Do all quizzes</p> <p>Participate in Forum 4 discussion</p>

TRAINING COORDINATION

<p>Training Coordinator:</p> <p>Mr. Jonathan P. Mwakijele Head of Management, Policy and Regulatory Unit AFRALTI Tel : +254 718 860 897 Email: Jmwakijele@afralti.org</p>	<p>ITU coordinator:</p> <p>Mr. Emmanuel Niyikora Programme Officer ITU Area Office for West Africa, Dakar Tel : +250 788312939 Email: emmanuel.niyikora@itu.int</p>
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REGISTRATION AND PAYMENT

ITU Academy portal account

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/radio-frequency-spectrum-economy-and-market-valuation-1>

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 960 per participant is applied for this training. Payment should be made via the online system using the link mentioned above for training registration at <https://academy.itu.int/training-courses/full-catalogue/radio-frequency-spectrum-economy-and-market-valuation-1>

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.**

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

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.

ITU BANK ACCOUNT DETAILS:

Name and Address of Bank:	UBS Switzerland AG Case postale 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 960
Payment Reference:	CoE-AFR 26453 – P.40590.1.07

4. **Other method of payment**

If due to national regulations, there are restrictions that do not allow for payment to be made using options 1 & 2 above, please contact the ITU coordinator for further assistance.