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## Training course outline

### ITU and African Advanced Level Telecommunications Institute

Title	<b>SMTP OM 4 - Economic and Market Tools of Spectrum Management</b>
Modality	Online Instructor led
Dates	5 – 30 September 2022
Duration	4 weeks
Registration deadline	4 September 2022
Training fees	<b>USD 200</b>
Description	The aim of this module is to introduce participants to the main economic principles and market-based mechanisms of spectrum management. It presents and analyzes available market tools for economic efficiency in the use of spectrum, such as auctions and spectrum pricing. It takes into account students' need to understand the overall context - especially how and where market- and price-based tools fit into a country's chosen regime of modern spectrum management.
Course code	<b>22OI500014MUL-E</b>

#### 1. LEARNING OBJECTIVES

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The aim of this module is to introduce students to the

- Main Economic Principles of Spectrum Management;
- Market-based mechanism of Spectrum Management;
- Available market tools for economic efficiency in the use of spectrum, such as auctions and spectrum pricing;
- Advanced-level knowledge of Modern Spectrum Management.

#### 2. LEARNING OUTCOMES

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It is expected that upon completion of the training session, participants will be able to:

##### Have knowledge of

- Economic principles of Modern Spectrum Management;
- Market-based tools that can be used for efficient Spectrum Management; and
- Major international practices of implementation of a market-based approach for Spectrum Management.

### An understanding of

- Principles and reasons for using economic/market-based tools for Spectrum Management;
- Economics of the Radio Frequency (RF) Spectrum as a Resource; and
- Modern Spectrum Management and associated economic and market-based tools.

### Special Skills of

- Ability to interpret that the current Spectrum Management is an economic problem in the liberalised and competitive telecommunications markets ;
- Ability to differentiate among various economic and market tools for Spectrum Management ; and
- Ability to identify the circumstance where each/ a combination of those tools might be most appropriate.

## 3. TARGET POPULATION

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This training is target at the professionals working in the telecommunications industry, Economics, Finance, Telecommunications Engineers, lawyers and regulatory staff across all departments.

Besides that, other institution, academia and individuals that are dedicated to building their capacity related to Modern Spectrum Management.

## 4. ENTRY REQUIREMENTS

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Basic understanding of Spectrum Management.

## 5. TUTORS/INSTRUCTORS

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NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Dr. John Mpapalika	Email: <a href="mailto:mpapalika2016@gmail.com">mpapalika2016@gmail.com</a> Tel: +255762545228
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## 6. TRAINING COURSE CONTENTS

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The topics covered in this module are:

- **Economics of spectrum as a resource**
  - Radio spectrum as an economic good
  - Spectrum as a valuable input
  - Spectrum value, spectrum scarcity and interference
  - Efficient economical allocation of spectrum
  - Radiocommunication services and spectrum management: economic overview
- **Spectrum liberalization**
  - What it is and why it is important
  - Towards modern spectrum management
    - Ronald Coase's influence
  - Spectrum management regimes
    - Recent policy developments

- Benefits and costs of liberalization
- A brief look at a few national/international experiences
- **Methods of incorporating economic forces and market mechanisms into SM**
  - The context of change
  - The new tools available
  - Market instruments available
  - Economic pricing options
- **Ways of ensuring access to spectrum**
  - Different ways of ensuring spectrum access
  - Economic aspects of sharing spectrum
  - Licence- vs rules-based sharing
  - Interference management for market-based spectrum management
- **Spectrum assignment and the design of spectrum auctions**
  - Different methods of assigning spectrum
  - The organisation and logistics of auctions
  - Types of auction
  - Additional features of auction design
- **Setting up rules for secondary markets in spectrum trading**
  - Spectrum trading: what it is and why it is important
  - Enabling spectrum trading
  - Objections to spectrum trading
  - Spectrum trading in practice
- **Re-purposing and re-farming spectrum bands**
  - Spectrum re-farming (also referred to as spectrum *redployment*) is a combination of administrative, financial and technical measures aimed at removing users or equipment of the existing frequency assignments either completely or partially from a particular frequency band
  - The same frequency band may then be allocated to the same or different service(s)
  - These measures may be implemented in short, medium, or long time-scales
- **Spectrum commons and collective use of spectrum**
  - Economic case for unlicensed bands
  - Varieties of collective use of commons
  - Economics of the commons
  - Access to unlicensed bands: examples
  - Economics of the choice between licensed and unlicensed bands
  - Estimating economic value of unlicensed bands
- **Band managers, co-regulation and self-regulation**
  - Band managers, band management and band access regulations
  - Types of band management
  - Case studies
- **Spectrum pricing and valuation**
  - Different types of pricing and valuation
  - Traditional spectrum charges
  - Opportunity cost pricing of spectrum
  - Other ways of pricing spectrum
- **Public sector spectrum**
  - The importance of public sector spectrum
  - Stages in public sector reform
  - An example of public sector reform

## 7. TRAINING COURSE SCHEDULE

Week / Topic	Activity	Exercises and Interactions
<b>Week 1</b> Economic Principles of Spectrum Management	Read Unit 1, 2 & 3 Materials and references Make comments on the Forum of week 1 Take a short quiz of week 1	<b>Forum topic 1:</b> Discuss Economics of Radio Frequency Spectrum as a Resource <b>Quiz 1 covering week 1 contents</b>
<b>Week 2</b> Economic Principles of Spectrum Management	Read Unit 4, 5 & 6 Materials and references Make comments on the forum of Week2 Take a short quiz of Week 2	<b>Forum topic 2:</b> Discuss the Current Spectrum Management is an Economic Problem in the Liberalized and Competitive Telecommunications Market <b>Quiz 2 covering week 2 contents</b>
<b>Week 3</b> Market-based Mechanism of Spectrum Management	Read Unit 7, 8 & 9 Materials and references Make comments on the forum of Week 3 Take a short quiz of Week 3	<b>Forum topic 3:</b> Give reasons for the need for the Modern Spectrum Management in the liberalized and competitive Telecommunications Markets. <b>Quiz 3 covering week 3 contents</b>
<b>Week 4</b> Market-based Mechanism of Spectrum Management	Read Unit 10 & 11 Materials and references Make comments on the Forum of week 4 Take a short quiz of week 4	<b>Forum topic 4:</b> Discuss major differences between the Current and Modern Spectrum Management <b>Quiz 4 covering week 4 contents</b> <b>End of Course Assignment:</b> Discuss the available Market -based tools of Spectrum Management and how your country applied them. (1,000 to 1,200 words).

## 8. METHODOLOGY (Didactic approach)

This course will be delivered using instructor-led online learning. The course is delivered using PowerPoint 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
- Live lectures and discussions will be conducted through ZOOM every week on Monday and Wednesday from 1500 hours to 1700 Hours EAT
- Interactive chat sessions and forum discussions
- Quizzes and
- End of course Assignments

## 9. EVALUATION AND GRADING

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Students' performance in this course will be determined using a combination of grades for the forum, self-assessment quizzes and the end of course assignment. Where:

- Forum posts for the 4 weeks will be awarded 10 points
- Self- Assessments quizzes will be awarded 40 points
- End of course assignment will be awarded 50 points

The forum will account for 10% of the total score, Quizzes 40% and the end of course assignment 50%.

A candidate who attains a score of at least 60% will be awarded ITU certificate.

## 10. TRAINING COURSE COORDINATION

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