



Training course outline

ITU and Sudatel Telecommunications Academy (SUDACAD)

Title	Ultra-Microwave Broadband Internet Access
Modality	Face-to-face
Dates	26-28 July 2022
Duration	3 Days
Registration deadline	24 July 2022
Training fees	150\$
Description	This training aims to help participants learn and understand Microwave technologies and their effects on business management, and to be aware of Microwave planning, capacity configuration, Microwave design, Microwave route and Microwave tools.
Code	22WS28127ARB-A

1. LEARNING OBJECTIVES

This training aims to help participants learn and understand Microwave technologies and their effects on business management, and to be aware of Microwave planning, capacity configuration, Microwave design, Microwave route and Microwave tools.

2. LEARNING OUTCOMES

By the end of this training, participants should be able to:

- Understand concepts of Microwave technology.
- Understand the key concepts behind the tools for solving various problems in microwave engineering.
- Understand Microwave planning, analysis, design and development of microwave systems.
- Understand how does microwave planning tool working.

3. TARGET POPULATION

This training course targets those who are responsible for Network Operation Center (NOC) engineers, Microwave Planning and Microwave project engineers, regulators analysis engineers and academia.



4. ENTRY REQUIREMENTS

The course is flexible, yet intensive. Applicants are required to have:
Basic of Microwave technologies and to be aware of Microwave planning, capacity configuration, Microwave design, Microwave route and Microwave tools.

5. TUTORS/INSTRUCTORS

Name of tutor(s)/instructor(s)	Contact details
Dr. Musaab Ali Abdelrahim	Musab20000@yahoo.com

6. TRAINING COURSE CONTENTS

- **Digital Microwave Communication Overview**
 - Transmission Method for Communication
 - Fiber and Microwave transmission
- **Digital Microwave Equipment Introduction**
 - Types of Digital MW Equipment
- **Microwave Propagation and Anti fading Technologies**
 - Microwave Propagation and fading
- ***Anti-fading Technologies**
 - Automatic Transmit Power Control
 - Round table discussion
- **Microwave Network Planning**
 - How to design a Microwave link?
 - Basic Requirements for Microwave design?
- **Microwave Formulas calculation**
 - Calculating the Minimum RSL
 - Formula for Calculating the Free Space Loss
 - Formula for Antenna diameter
- **Microwave Planning Tools**
 - Pathloss Tools
 - Capacity configuration
 - Round table discussion
- **Capacity configuration**
 - Maximum Ethernet throughput (Mbps)
 - Band channel
- **Site Surveys**
 - Preparation Before Microwave Site Surveys
 - Information Collection
- **O&M analysis**
 - Microwave troubleshooting



- Round table discussion

7. TRAINING COURSE SCHEDULE (Khartoum Time)

Date for 1 st day	Time; Start time	Topics
26/July/2022	09 :00 - 09 :30	<ul style="list-style-type: none">• Record attendance.• Setting the rules.
	09 :30 - 11 :00	<ul style="list-style-type: none">• Digital Microwave Communication Overview• Digital Microwave Equipment Introduction
	11 :00 - 11 :30	<ul style="list-style-type: none">• Break.
	11 :30 - 14 :00	<ul style="list-style-type: none">• Microwave Propagation and Anti fading Technologies• Anti-fading Technologies

Date for 2 nd day	Time; Start time	Topics
27/July/2022	09 :00 - 09 :30	<ul style="list-style-type: none">• Record attendance.
	09 :30 - 11 :00	<ul style="list-style-type: none">• Microwave Network Planning• Microwave Formulas calculation
	11 :00 - 11 :30	<ul style="list-style-type: none">• Break.
	11 :30 - 14 :00	<ul style="list-style-type: none">• Microwave Planning Tools

Date for 3 rd day	Time; Start time	Topics
28/July/2022	09 :00 - 09 :30	<ul style="list-style-type: none">• Record attendance.
	09 :30 - 11 :00	<ul style="list-style-type: none">• Capacite configuration• Site Surveys
	11 :00 - 11 :30	<ul style="list-style-type: none">• Break.
	11 :30 - 14 :00	<ul style="list-style-type: none">• O&M analysis• Closing Ceremony.• Group Picture.



8. METHODOLOGY (Didactic approach)

- Instructor-led class lectures and presentations– slides.
- Reviews and revisions.
- Case studies.

9. EVALUATION AND GRADING

Participants will be evaluated according to:

- Active interaction in the group exercises and discussions.
- Planned Quizzes.
- Dedication in attending the sessions.

Grading will take into consideration attendance (30%) and a final overall exam (70%).
IMPORTANT: a passing mark of 60% is required for obtaining a completion certificate.

10. TRAINING COURSE COORDINATION

Course coordinator: Ms. Sara Elmakki Planning & Development Dept., SUDACAD Mobile: +249 11 7947230 Tel: +249 183 490 999 Email: saraab@sudatel.sd	ITU coordinator: Mr. Ahmed El Raghy Senior Advisor ITU Arab Regional Office Tel: +202 3537 1777 Mobile: +201005281908 Fax: +202 3537 1888 Email: ahmed.elraghy@itu.int
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