

Fiber Optic School #758 at AFRALTI

Brief Report

17th August 2018

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1. Introduction

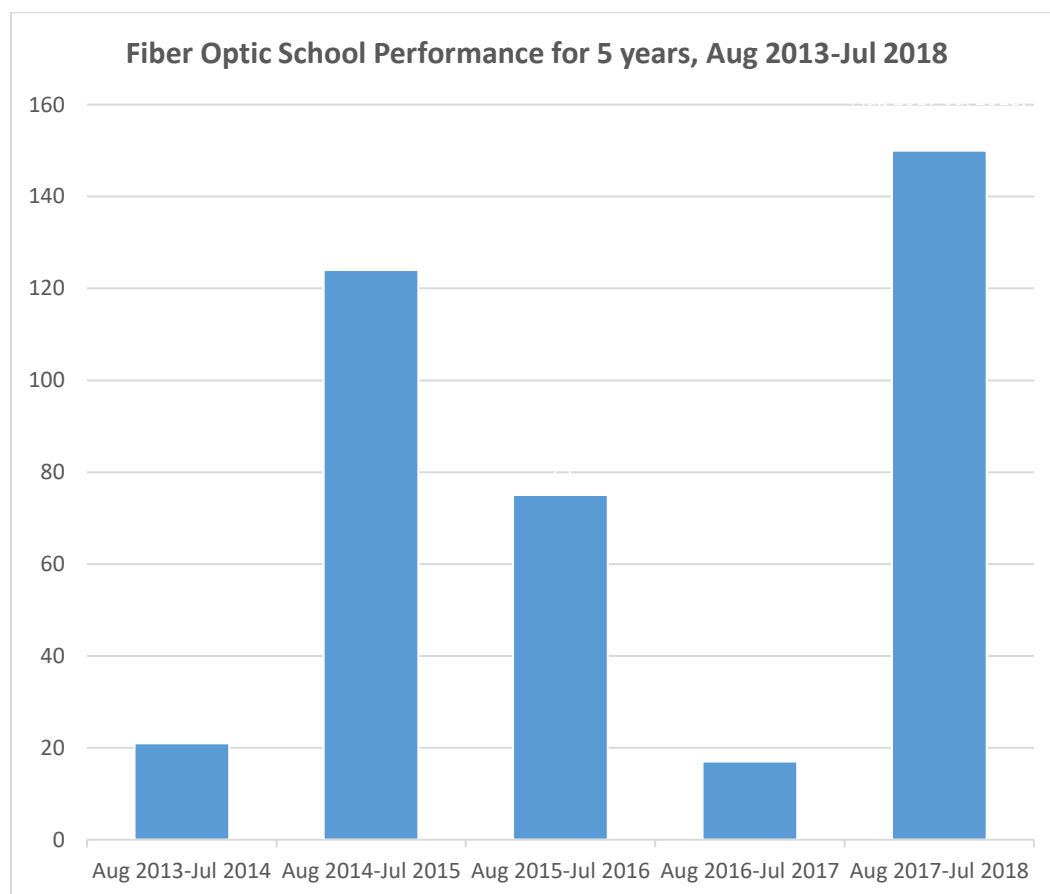
AFRALTI became FOA Approved School in June 2013 and training started in August 2013. Currently in Africa, there are about 11 FOA Approved Schools. In EAC, there other two FOA Approved Schools all of them are in Kenya. Till so far AFRALTI has trained 391 participants from 12 Countries.

2. Growth of Fiber Optic Training at AFRALTI

2.1. The trend of Fiber Optic training from August 2013 to July 2018

Table 1 – Number of participants trained in different periods (August 2013 – July 2018)

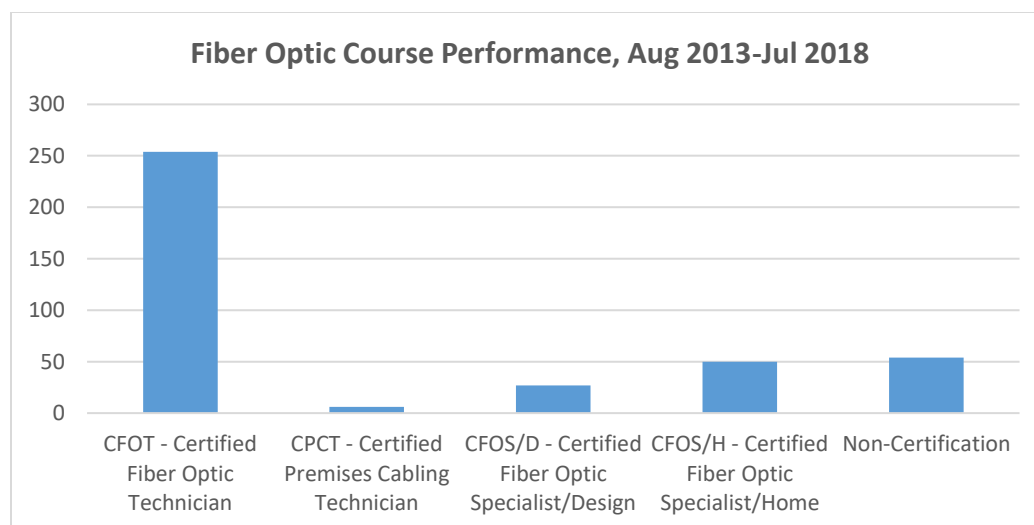
S/n	Period	Number of Participants Trained
1.	August 2013 to July 2014	21
2.	August 2014 to July 2015	124
3.	August 2015 to July 2016	75
4.	August 2016 to July 2017	17
5.	August 2017 to July 2018	150



2.2. Number of Participants Trained, 12th August 2013 to 31st July 2018 in different Courses

Table 2 – Participants trained in different courses

Course/Certification	# Trained
CFOT - Certified Fiber Optic Technician	254
CPCT - Certified Premises Cabling Technician	6
CFOS/D - Certified Fiber Optic Specialist/Design	27
CFOS/H - Certified Fiber Optic Specialist/Home	50
Non-Certification	54
Total	391
Participants were from 12 Countries (Kenya, Tanzania, Uganda, Rwanda, Burundi, South Sudan, Malawi, Zambia, Somalia, Nigeria, DRC and Sierra Leone)	



3. Conclusion and Recommendation

AFRALTI is encouraging other Countries to embrace Fiber Optic Training for their Technicians and Engineers in ICT Sector.

Since AFRALTI has invested a lot in Mobile Fiber Optic Training Kit it is now possible to train at Customers' premises either within Kenya or outside Kenya. When training outside Kenya it attracts additional cost on air ticket and daily subsistence allowances for the FOA Instructor.

For interested parties please see below the training calendar, Annex 1, August 2018-March 2018 and detailed Course Outlines (CFOT, CPCT, CFOS/D and CFOS/H-FTTH).

Annex 1 – Training Calendar for the remaining period, August 2018 to March 2019

S/n	Course Title	Date	No Days	Location	Tuition Fee for AFRALTI Member States in USD	Tuition Fee for Non-AFRALTI Member States in USD
47	Certified Fiber Optic Technician (CFOT)	6th-10th Aug 2018	5	Nairobi, Kenya	950	1,140
48	Certified Premises Cabling Technician (CPCT)	13th-17th Aug 2018	5	Nairobi, Kenya	950	1,140
50	Certified Fiber Optic Network Design Specialist (CFOS/D)	3rd-7th Sep 2018	5	Nairobi, Kenya	950	1,140
51	Certified Fiber Optic Specialist/Home (CFOS/H)-FTTH	10th-14th Sep 2018	5	Nairobi, Kenya	950	1,140
53	Certified Fiber Optic Technician (CFOT)	1st-5th Oct 2018	5	Nairobi, Kenya	950	1,140
54	Certified Premises Cabling Technician (CPCT)	8th-12th Oct 2018	5	Nairobi, Kenya	950	1,140
56	Certified Fiber Optic Network Design Specialist (CFOS/D)	5th-9th Nov 2018	5	Nairobi, Kenya	950	1,140
57	Certified Fiber Optic Specialist/Home (CFOS/H)-FTTH	12th-16th Nov 2018	5	Nairobi, Kenya	950	1,140
58	Certified Fiber Optic Technician (CFOT)	19th-23rd Nov 2018	5	Nairobi, Kenya	950	1,140
59	Certified Premises Cabling Technician (CPCT)	21st-25th Jan 2019	5	Nairobi, Kenya	950	1,140
60	Certified Fiber Optic Network Design Specialist (CFOS/D)	28th Jan-1st Feb 2019	5	Nairobi, Kenya	950	1,140
61	Certified Fiber Optic Specialist/Home (CFOS/H)-FTTH	4th-8th Feb 2019	5	Nairobi, Kenya	950	1,140
62	Certified Fiber Optic Technician (CFOT)	11th-15th Feb 2019	5	Nairobi, Kenya	950	1,140

63	Certified Premises Cabling Technician (CPCT)	18th-22nd Feb 2019	5	Nairobi, Kenya	950	1,140
64	Certified Fiber Optic Network Design Specialist (CFOS/D)	4th-8th Mar 2019	5	Nairobi, Kenya	950	1,140
65	Certified Fiber Optic Specialist/Home (CFOS/H)-FTTH	11th-15th Mar 2019	5	Nairobi, Kenya	950	1,140

See below detailed course outlines.



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

COURSE OUTLINE

Title:	CERTIFIED FIBER OPTIC TECHNICIAN (CFOT) COURSE
Duration:	5 days

Course Overview

Fiber Optic course is designed for anyone interested in becoming a Certified Fiber Optic Technician (CFOT). This course combines theory and hands-on activities. This leads to final test required by the FOA (Fiber Optic Association) given and graded on the final class day. The course also introduces the participant to industry standards governing outside plant and premises fiber networks. Upon successful completion, this certification is recognized by many companies all over the world including customers and installers.

Objective

Course prepares the participant to take the CFOT (Certified Fiber Optic Technician) Test given and graded at the end of class. Participant will be able to effectively and efficiently design, install, terminate, and test multimode/singlemode fiber optic networks.

Target Audience

IT Managers, Telecommunication Engineers, Voice, Data and Video (VDV) and FTTx Technicians.

Core Areas Covered

1. How Fiber works, advantages and disadvantages of optical Fiber
2. Introduction to optical Fiber transmission systems
3. Manufacture of optical Fiber cables
4. Types, characteristics, classification and structure of optical Fibers
5. Optical devices
6. Optical Networks
7. Safety precautions
8. Optical Fiber installation methods
9. Optical Fiber splicing and termination methods
10. Optical Fiber link testing
11. Optical power budgeting calculations
12. Introduction to fiber-to-the-home.
13. Trouble shooting and maintenance procedures

Methodology

Lectures, PowerPoint Presentation, and hands on practical in splicing, connectorization, termination and testing.

Along with chapter tests, class discussions, and substantial hands-on activities, the CFOT Test is given and graded at the end of the class. Participants will demonstrate the ability to build and test a fiber optic link.

Course Outline

Day 1

- Introduction to optic fiber.
- History of Fiber Optics.
- Theory of light.

- How fiber works,
- Fiber specifications (geometry, attenuation, bandwidth).
- Frequency spectrum and multiplexing (WDM)
- Fiber Optics Safety.
- Terms and Definitions.
- Hands-on Session: view samples of fibers and cables.

Day 2

- How fiber optic links work (transmitter, receiver, power budget)
- Fiber Optic communication networks.
- Networks (telecom, data, CATV, etc.).
- Fiber optic technology and manufacture of optic fiber cable
- Preliminary planning and detailed survey
 - Trenching
 - Ducts and cable laying
- Standards and Code compliance.
- Reading prints and specs.
- Planning the installation.
- Pulling cable (installation hardware, guidelines to pulling, practices.
- Documentation.

Day 3

- Types of Cables.
- Cable preparation
- Connectorization.
- Fusion and mechanical splicing
- Hardware (patch panels, splice closures, conduit, etc)
- Hands on:
 - Termination (one type, adhesive or prepolished/splice)

Day 4

- Continuity and tracing.
- Visual inspection of connectors and bare fiber.
- Loss with power meter and source.
- Hands on: Basic insertion loss testing with source and power meter,

Day 5

- Fiber optic design and PON
- PON
- FTTX

- Maintenance of a fiber optic link
- OTDR techniques: Trouble shooting and service restoration
- Questions and answers

Administering of Test: Written CFOT Test (approx. 2 hours)



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

TRAINING WORKSHOP OUTLINE

Title:	Certified Premises (Structured) Cabling Technician (CPCT)
Duration:	5 Days

Course Overview: This course is intended first to define what structured cabling is by putting it into historical development context. The course also covers standards used in premises cabling. It covers copper, Fiber and wireless technologies used and corresponding components for multimode (OM1, OM2, OM3 and OM4) and single mode fibers, copper (UTP Cat 3, 5 and 6 and coax) and wireless. Student will learn how Wi-Fi technology is incorporated in cabling systems. The course will also go into testing methods and testing equipment used. There will be hands on labs to show various types of materials used, tools and equipment. We will have a rack and patch panels a board with 66 and 110 terminating blocks, plugs and jacks for cat5e cables. Students will learn various termination methods for multimode and single mode fibers.

The course will be conducted to meet FOA CPCT certification.

Target Audience: All persons working for or intending to work for telecommunication companies, ISPs, ICT consulting firms to carry out design, installation, and maintenance of cable networks. Also those carrying out marketing of cabling equipment and materials may attend.

Pre-requisite/s: Applicants must have a minimum of O-level or its equivalent of academic education.

Methodology: The course will be conducted in class using power point presentations, classroom discussions and lab demonstrations designed to give participants practice.

Workshop Objectives: At the end of the course participants should be able to design a structured cable network, distinguish various types of cables. Be able to, install, prepare and

terminate all types of premises cables inside buildings and campus setup. Participants will be able to make SC, ST and LC connectors in field. They will be able to make Cat5e and multimode fiber patch cords. They should be able to carry out trouble shooting of copper and fiber installation. Participants will also appreciate how fiber copper coax and wireless are integrated to form a structured cabling system.

Workshop Contents/Topics:

1. A History of Cabling for Communications
2. Prefabricated Cabling Systems
3. Standard For structured Cabling Systems
4. Computer Networks
Coax Cables In Structured Cabling Systems
5. Data Centres
Designing structured Cabling Systems
6. Fiber Optics and Premises Cabling
7. Fiber Optics For Wireless
8. Installing UTP Cabling
9. The language of structured cabling
Types of MM Fiber (om1,OM1, OM2, OM3, OM4)
10. OLANs: Fiber Optic Local Area Networks
11. Structured Cable: UTP Termination (110 blocks, patch panels, RJ-45 for Cat5e)
12. Optical fiber terminations(connectorization)
13. Structured Cabling installation
14. Testing UTP Cabling
15. Testing optical fiber cable installation
16. The Role of Fiber Optics In Structured Networks
17. Unshielded Twisted Pair
18. Wiremap For UTP Cabling

Practical

1. UTP cable termination on patch panels and RJ-45
2. Terminating optical fiber cable
3. Testing UTP cable
4. Testing optical fiber installation

Administering of Test: Written CPCT Test (approx. 2 hours)



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

COURSE OUTLINE

Title: CERTIFIED FIBER TO THE HOME (FTTH)
Duration: 5 days

Certification to be given: **CFOS/H**

Pre-requisite: **CFOT or CPCT**

Course Description: The course will cover Fiber to the home theory, design, installation and testing and trouble shooting. There will be practicals in cable preparation, splicing, termination and testing. This will be done using classroom power point presentations and lab work.

5-Day Training Schedule

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction to FTTX	FTTH PON: Passive Optical Network	Fiber To The Home Installation 1. Installation tools 2. Jargon 3. Background 4. Cable Types And Hardware	1. Outdoor cable installation 2. Duct, aerial, direct burial 3. Microduct solutions 4. Drop cable installation	1. Link Testing 2. OTDR Testing PONs 5. OTDR Testing From CO 6. OTDR Testing From Subscriber 7. Other FTTx 8. Testing Issues

		5. Subscriber Drops	5. Fiber terminations on with pigtail	FTTx Safety Issues
Fiber To The Home Architectures	Triple Play Systems BPON GPON EPON RFOG WDM and PON Other Uses For PONs	Practical: 1. Installation of indoor hardware rack and wall mounting	Practical: Splicing and joint closing	Hands on tests 1. OTDR Testing 2. Troubleshooting
FTTH in MDUs (Multiple Dwelling Units)	FTTx hardware and components Cables Splitters Cabinets Subscriber components	Practical: 2. Fiber arrangement and trunking 3. Connector installations	Testing FTTH 1. Key factors affecting network 2. Testing during construction 3. Testing for commissioning 4. Troubleshooting	EXAM
FTTH PON Types	Practical View samples Set up FTTX link	Practical: 4. Multicore cable termination	Hands tests with Power source and meter, visual fault locator	Course Review and Closing

Administering of Test: Written CFOS/H Test (approx. 2 hours)



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

COURSE OUTLINE

Title: CERTIFIED FIBER OPTIC NETWORK DESIGN (CFOS/D)
Duration: 5 days

Certification to be given: *CFOS/D*

Pre-requisite: *CFOT or CPCT*

Course Description: The five day course will give participants knowledge and skills they need to determine demand for optical fiber network by collecting data. It will show how to present this data for evaluation. Participants will learn how to carry out detailed design such as route planning, type and quantity of components requirements for outside plant and premises network. The course also covers, documentation project management, making project proposals and choosing contractor.

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction to design Collecting data 1.Customer requirements 2.Technology requirements	1. Link power budget	1. Planning to install 2. Develop test plan 3. Planning for restoration	Case study 3 Long Distance telecom Network	Case Study 8 CCTV surveillance Link

<p>3. Business requirements</p> <p>4. Environmental requirements</p> <p>5. Vendor requirements</p>				
<p>1. Carrying out preliminary survey</p> <p>2. Fundamental design</p> <p>3. Making preliminary estimates</p> <p>4. Analysing options</p> <p>5. Seeking approvals</p>	<p>1. Determining Copper, fiber and wireless combination</p> <p>2. Choosing Transmission equipment requirements</p> <p>3. Choosing components for premises cabling</p> <p>4. Choosing components for Outside plant</p>	<p>1. Choosing a contractor</p> <p>2. Managing project</p> <p>3. Final tests</p> <p>4. Documentation</p>		EXAM
<p>1. Documentation at preliminary stage</p> <p>2. Detailed survey</p>	<p>1. Making detailed estimates</p> <p>2. Documentations at detailed design stage</p>	<p>Case study 1.</p> <p>Fibre to the Home</p>	<p>Case Study 5</p> <p>Campus LAN backbone</p>	
<p>1. Data processing</p>	<p>1. Making request for proposal\Request for quotations</p> <p>Evaluations of bids</p>			Course evaluation and closing

5- Day Schedule

Administering of Test: Written CFOS/D Test (approx 2 hours)

Reference materials

Textbook: Fiber Optics Reference Guide by Jim Hayes, Supplementary Study Materials includes Workbook and Lab Manual.

AFRALTI CFOT, CPCT, CFOS/D, CFOS/H FOA Approved School # 758

<http://foa-approved.org/schools/african-advanced-level-telecommunications-institute-afralti>

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