ITU Centres of Excellence Network for Arab Region

Smart Tunisian Technoparks (S2T)

Online Training Course on

Infrastructure Solutions for Broadband Applications
24-30 May 2021

TRAINING COURSE OUTLINE

COURSE DESCRIPTION

Title	**Infrastructure Solutions for Broadband Applications**
Objectives	This course helps the auditors to understand the ever-increasing market for FTTx networks, PON and HFC transmission and the infrastructure components involved. It looks at fiber types, connectors, apparatus, termination, design, losses, installation, planning, inspection and testing, to provide a broad education on all areas of Broadband Access and FTTx infrastructures.
Dates	24-30 May 2021
Duration	7 Days
Registration deadline	17 May 2021
Training fees	150 USD
Course code	21OI26428ARB-E

DESCRIPTION OF THE TRAINING COURSE

This training will focus on the understanding of the basic concepts related to:

- Understand the infrastructure solutions that support Broadband Access
- Review the impact that fiber is having over copper in the broadband market with higher speeds and greater bandwidth
- Review the copper based network technologies including CATV, DOCSIS, G.Fast

- Look at optical networks including HFC, RFoG and PON and learn where these are used today.
- Understand the topologies and architectures of FTTx networks
- Discover the ways of connecting and splitting fibers in the field
- Consider loss budgets and contributors
- Learn about the latest advances in wave division multiplexing, and the fiber cables than can be used to support this.
- Understand fiber cable characteristics, and what can impact signal quality
- Take a look at cost exercises and compare different network architectures

LEARNING OUTCOMES

This training aims at providing all participants with extensive insights on Infrastructure Solutions for Broadband Applications.

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

- ✓ Understand the infrastructure solutions that support Broadband Access.
- ✓ Understand PON architecture and his possible implementation.
- ✓ Identify the different varieties of PON architectures.
- ✓ Determine the differences between BPON, GPON and EPON.
- ✓ Specify the required components that facilitate FTTx installations.
- ✓ Calculate the optical loss budget for a FTTx network.

TARGET POPULATION

Recommended for any person involved in design, installation, and project management of infrastructures for Broadband Access, HFC, FTTx and PON solutions.

ENTRY REQUIREMENTS

No pre-requisite experience is required to take this course as the subjects covered will be of interest to anyone working in the telecommunication field.

TUTORS/INSTRUCTORS

NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Mourad MENIF is an engineer and Professor and a researcher at Sup'Com (Higher School of Communication of Tunis) Dr. Mourad MENIF is delivering seminars in wide variety of subjects related to telecom and network at an international level with ITU (International Telecommunication Union).	Mourad.mnif@supcom.tn

TRAINING COURSE CONTENTS

- _ Broadband Applications, Access, FTTx, PON and service providers
- _ RF transmission over coax, spectrum, signaling, channels, modulation
- _ Optical Systems HFC & RFoG
- _ Optical Systems PON, EPON, GPON
- _ Optical Fiber Cable and connectors, wavelengths, spectrum, cable installation practices
- _ PON Architecture, OLTs, ONUs, splitters, WDMs
- _ FTTx Loss Budgets, architectures
- _ Connectivity in the CO. Fiber bend radius protection, access, routing, and cleaning
- _ Connectivity in the ODN, closures, OSP
- _ FTTx deployment examples, costing exercises

TRAINING COURSE SCHEDULE (Tunis Time)

Day/Session	Time; Start time	Topic	Exercises and interactions
Day 1 **24/05/2021**	09:00 - 12:00	**Broadband access technologies** • wireline solution • wireless solution	A forum will be activated in order to interact with the participants (17:00-18:00) Quiz1 (14:00-16:00)
Day 2 **25/05/2021**	09:00 - 12:00	**FTTx standards** • BPON • EPON • GPON • XGPON • NGPON	A forum will be activated in order to interact with the participants (17:00-18:00) Quiz2 (14:00-16:00)
Day 3 **26/05/2021**	09:00 - 12:00	**FTTx architecture** • Pt-2-pt • Pt-2-Multi-pt • FTTH/B/N/P/...	A forum will be activated in order to interact with the participants (17:00-18:00) Quiz3 (14:00-16:00)

Day 4 27/05/2021	09:00 - 12:00	**FTTx infrastructure** • Splitter • Panel, closure, • OLT • ONT • Fiber • Connectors and polishing	A forum will be activated in order to interact with the participants (17:00-18:00) Quiz4 (14:00-16:00)
Day 5 28/05/2021	09:00 - 12:00	**FTTx loss budgets** • dB, dBm • Class A,B,B+,C,C+ • wireline solution • wireless solution	A forum will be activated in order to interact with the participants(17:00-18:00) Quiz5 (14:00-16:00)
Day 6 29/05/2021	09:00 - 12:00	**Connectivity** • Central Office • ODN	A forum will be activated in order to interact with the participants (17:00-18:00) Quiz6 (14:00-16:00)
Day 7 30/05/2021	09:00 - 12:00	**FTTx deployment** • Geo-marketing study • Dwelling census and zoning • Fiber Outside Plant **EVALUATION**	Final evaluation (Open the whole day)

METHODOLOGY (Didactic approach)

Course materials: Each module will be available for the course material on the website
Online Discussion Forums: Participants are expected to participate actively in discussion forums on selected topics throughout the week.

EVALUATION AND GRADING

Evaluation will be based on quizzes every day and a final exam.
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

TRAINING COURSE COORDINATION

Course coordinator:	ITU coordinator:
Mrs. Houda Jarraya Focal point at S2T Tel: + 216 71 856 073 Mobile: +216 97 879 228 / 28 300 878 Fax: +216 71 857 803 Email: houda.jarraya@s2t.tn houda.jarraya@gmail.com	Eng. Mustafa Al Mahdi Programme Officer Arab Regional Office-ITU Tel: +202 3537 1777 Mobile: +20114 117 75 73 Fax : +202 3537 1888 Email: mustafa-ahmed.al-mahdi@itu.int

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

Training 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/index.php/training-courses/full-catalogue/infrastructure-solutions-broadband-applications

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 150 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/index.php/training-courses/full-catalogue/infrastructure-solutions-broadband-applications

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 150
Payment Reference:	CoE-ARB 26428 - WBS No. P.40592.1.03

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.