



**ITU Centres of Excellence Network for Europe**

**The Abdus Salam International Centre for Theoretical Physics**

**FACE-TO-FACE Training Course on  
TECHNICAL ASPECTS OF WIRELESS SOLUTIONS  
FOR THE INTERNET OF THINGS (IoT)**

**Trieste, Italy  
September 2-4, 2019**

**COURSE OUTLINE**

**COURSE DESCRIPTION**

Title	Technical Aspects of Wireless Solutions for the Internet of Things (IoT)
Objectives	There is general consensus that IoT has enormous potential to deliver great impact on the economy and on society at large. Having a good grasp of the relevant technical aspects is a must for bringing this to fruition. This capacity building course aims to provide the audience with a better technical understanding of wireless solutions for IoT. Participants will be exposed to the general aspects of IoT networks and will then dive into specifics of LPWAN and cellular solutions tailored to IoT like LTE-M and NB-IoT. Practical examples of IoT wireless technologies will be demonstrated.
Dates	September 2-4, 2019
Duration	3 days
Registration deadline	July 28, 2019
Training fees	USD 500
Course code	19WS24311EUR-E

**LEARNING OUTCOMES**

To understand the basic principles of wireless, including wireless IP and network topologies.
To analyze the different connectivity families and standards.
To describe the details of LPWANs, LoRa, SigFox and alternatives.
To describe the details of Low Power WiFi .

To understand the basic principles of Cellular 3GPP technologies suited for object to object communication.

To identify the relevant issues for network planning for IoT.

## TARGET POPULATION

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The training course is designed for:

- Electrical engineers
- Telecommunications engineers
- Computer scientists
- Regulators
- Telecom Operators
- Networks Operators

## TUTORS/INSTRUCTORS

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NAME OF TUTOR(S)/INSTRUCTOR(S)	CONTACT DETAILS
Ermanno Pietrosevoli, ICTP	ermanno@ictp.it
Marco Zennaro, ICTP	mzennaro@ictp.it
Sami Tabbane, Ecole Supérieure des Communications de Tunis	sami.tabbane@supcom.tn

## EVALUATION

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We will evaluate presentations, practical exercises and a final exam with multiple choices for grading using the following weights:

$$G = 0.2 \times W + 0.6 \times M + 0.2 \times I$$

Where: W – presentation grade, M – written exam/multiple choice grade, I – practical exercises grade

## TRAINING SCHEDULE AND CONTENTS / AGENDA

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### Agenda (for face-to-face courses)

Date for 1st day	Time	Topics/Activities
9/2/2019	Morning session	Introduction to IoT (MZ)
		Wireless standards for IoT (EP)
	Afternoon session	Technical and Regulatory aspects of Radio Propagation
		Cellular 3GPP technologies (ST)
9/3/2019	Morning session	Introduction to LPWAN (EP)
		Introduction to LPWAN (EP)
	Afternoon session	LoRa, LoRaWAN and SigFox
		Radio planning basics (ST)
9/4/2019	Morning session	IoT Powering
		Telemetry

	Afternoon session	IoT Planning (LoRAWAN and NB-IoT cases) (ST)
		Case Studies

## METHODOLOGY

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The course will include instructor-led presentations, case studies, practical exercises and study assignments.

## COURSE COORDINATION

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<b>Course coordinator:</b> Name: Marco Zennaro Email address: mzennaro@ictp.it	<b>ITU coordinator:</b> Name: Jaroslaw Ponder Email address: jaroslaw.ponder@itu.int
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## REGISTRATION AND PAYMENT

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### 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 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/technical-aspects-wireless-solutions-internet-things-iot>

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 500 per participant is applied for this training. Payments 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/technical-aspects-wireless-solutions-internet-things-iot>

#### 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](mailto: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 500
Payment Reference:	CoE-EUR 24311-WBS P.40595.1.09

#### **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.

#### **CERTIFICATES**

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Each fully registered participant who will successfully complete the course, based on the evaluation, will receive an ITU Certificate after the course.