



ITU CENTRES OF EXCELLENCE NETWORK FOR ASIA PACIFIC REGION

Wireless Communication Centre, Universiti Teknologi Malaysia

**Online Training Course on
“Fifth Generation (5G) Implementation: Practices and Case Studies”
28th June to 11th July 2021**

TRAINING COURSE OUTLINE

COURSE DESCRIPTION

Title	Fifth Generation (5G) Implementation: Practices and Case Studies
Method of delivery	Online instructor led
Objectives	<p>5th Generation technology is here. Globally, various stages of 5G implementations such as trialling, licensing, deploying, limited launches, nationwide launches have taken place. Implementation challenges exist, and innovative deployment approaches are required before the full potential of 5G network and services can be realized. This course aims to equip participants with industry best practises and lessons learned in 5G network implementation. The specific objectives of the course are</p> <ul style="list-style-type: none">• To equip the participants with the understanding of 5G implementation challenges• To equip the participants with an understanding of the spectrum pricing, innovative licensing and approaches for spectrum sharing.• To equip the participants with the understanding of the approaches of infrastructure sharing and network deployment strategies• To equip the participants with the understanding of 5G KPIs measurement and benchmarking• To equip the participants with the understanding of best practise to achieve public acceptance of 5G roll out.• To equip the participants with the understanding of public acceptance of 5G roll-out.• To equip the participants with the understanding of successful commercial 5G use cases, operators’ case study and lesson learned
Dates	28 th June to 11 th July 2021

Duration	2 Weeks
Registration deadline	21 st June 2021
Training fees	USD150
Course code	21OI26547ASP-E

LEARNING OUTCOMES

Upon completion of this training course, participants will be able to acquire the following:

- review the 5G technology features
- discuss the 5G implementation challenges
- explain the spectrum pricing approaches
- elaborate the spectrum sharing and innovative licensing approaches
- explain the approaches for infrastructure sharing
- compare the network deployment strategies
- specify 5G KPIs measurements and benchmarking practices
- identify the RF interference issues between 5G and other technologies
- discuss the best practices for public acceptance of 5G roll-out.
- determine the factors for successful commercial use cases
- reflect on operators' case study and lessons learned.

TARGET POPULATION

Executives, managers, engineers, employees from regulators, government organization, telecom operators, semiconductor industry, vertical industries, academia who are dealing with the implementation of 5G network and services. Other institutions and individuals that are dedicated to building their capacity related to 5G Technology are also welcome to participate.

FACILITATOR/EXPERTS

The instructors for the training include experts from UTM and invited expert speakers from telecommunication industry and ITU.

EVALUATION

The assessment of the participants shall be based on the - time spent on the training and the following parameters:

Evaluation Parameter	Weightage (in %)
Quizzes	60 %
Assignment	10 %
Participation in Discussion Forum	15 %
Participation in live video lecture and interaction sessions	15 %

The minimum passing requirement for certificate is 60%.

TRAINING SCHEDULE AND CONTENTS

Week 1 Schedule

Date and Time (Kuala Lumpur Time Zone GMT +8)	Module	Scope/Activity
28 June 2021 (Mon) 2.30pm to 4.00pm	1. 5G Technology Review By Dr. Tharek Abd Rahman, MTSFB	<ul style="list-style-type: none"> • IMT-2020 Vision and Requirements • Key Capabilities of 5G versus 4G • Key usage scenarios • 3GPP Releases update • ITU 5G standardisation progress
29 June 2021 (Tue) 2.30pm to 4.00pm	2. 5G Implementation Challenges By Dr. Chee Yen (Bruce) Leow, UTM	<ul style="list-style-type: none"> • Spectrum availability & prices (cost for spectrum licensing) • Investment barrier • Deployment roadblocks • KPIs, QoS and QoE • Use cases and verticals readiness • Public resistance
30 June 2021 (Wed) 2.30pm to 4.00pm	3. Economics of Spectrum Management By Mr. Aamir Riaz, ITU	<ul style="list-style-type: none"> • Economics of spectrum • Components of spectrum price • Effective pricing • Innovative licensing • Spectrum auction vs beauty contest • Impact of spectrum prices • Case study
1 July 2021 (Thu) 2.30pm to 4.00pm	4. Spectrum Sharing By Dr. Marwan Hadri Azmi, UTM	<ul style="list-style-type: none"> • Spectrum sharing fundamental • Dynamic spectrum sharing • NR and LTE coexistence • Deployment options • Spectrum licensing innovation • Case study
2 July 2021 (Fri)	e-learning Activity: Quiz 1 (30%)	Participants to attempt the multiple choice questions quiz for Module 1-4 on ITU Academy e-learning page.

Week 2 Schedule

Date and Time (Kuala Lumpur Time Zone GMT +8)	Module	Scope/Activity
5 July 2021 (Mon) 3.30pm to 5.00pm	5. Mobile Infrastructure Sharing: Economics, Competition and Case Study By Dr. Zoltán Pápai, Infrapont Hungary	<ul style="list-style-type: none"> • Passive sharing • Acting sharing • Technical enablers • Multi-operator network • Economics of shared infrastructure • Rationalisation of legacy networks • Case study in Europe
6 July 2021 (Tue) 2.30pm to 4.00pm	6. Network Deployment Strategies By Dr. Thiaw Seng Ng, Ericsson	<ul style="list-style-type: none"> • Deployment options for brownfield and greenfield operators: NSA and SA • Balancing coverage and capacity • Roll out phases
7 July 2021 (Wed) 2.30pm to 4.00pm	7. Public Acceptance of 5G Roll-Out By Mr. Tien Han Chua, UTM	<ul style="list-style-type: none"> • Consumer perspective • Public resistance • EMF health & safety concern • Public education • Case study
8 July 2021 (Thu) 2.30pm to 3.30pm 3.30pm to 4.30pm	8.1 Commercial Use Cases, Operator's Case Study and Lessons Learned By Mr. Thomas Vidorrekto, Ericsson 8.2 5G Development and Public Use Cases in South Korea By Mr. YoungRo Lee, NIA & 5G Forum, South Korea	<ul style="list-style-type: none"> • 5G verticals • Go-to-market strategies • Commercial Use cases & Success stories • Case study and sharing of lesson learned by selected 5G operators around the world. 5G Development and Public Uses Cases under Korean's Digital New Deal.
9 July 2021 (Fri)	e-learning Activity: Quiz 2 (30%)	Participants to attempt the multiple choice questions quiz for Module 5-8 on ITU Academy e-learning page.
11 July 2021 (Sun)	e-learning Activity: Individual Assignment Submission (15%)	Participants to submit the individual assignment on ITU Academy e-learning page.

METHODOLOGY

The online instructor-led training course will include:

- Instructor-led live-streamed lectures
- Multimedia presentations
- Discussion forums
- Case studies
- Demonstrations
- Invited industry talks

The lectures will be presented by modules. Live lectures will be scheduled throughout the weeks. Recorded lectures will be made available for those who cannot attend the live sessions. Each session will last up to 2 hours, including Q&A interaction. The exact schedule for live lectures will be published on the course e-learning page on ITU Academy.

Discussion forums will be used to allow participants to interact with the trainers and also allow participants to exchange knowledge. Discussion topics can be posted by trainers and also participants.

The assignment shall be uploaded to the e-learning website before the due date.

All official announcements will be made through the Announcement Forum in the e-learning course page.

<p>Universiti Teknologi Malaysia's Coordinator</p> <p>Dr. Chee Yen Leow (Bruce) Course Coordinator, Wireless Communication Centre, UTM. Tel: +607-5536087 Fax: +607-5535252 Email: bruceleow@utm.my</p> <p>Ms. Jamaliah Binti Salleh Secretariat, Wireless Communication Centre, UTM. Tel: +6013-7694612 Fax: +607-5535252 Email: jamaliah_s@utm.my</p>	<p>ITU coordinator: Mr. Sean Doral Program Officer, ITU Regional Office for Asia-Pacific 5th Floor, Thailand Post Training Centre, 111 Moo3 Chaengwattana Road, Laksi Bangkok 10210, Thailand</p> <p>sean.doral@itu.int (Email) +41 2273 05438 (Works) +66 257 535 07 (Fax)</p>
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COURSE COORDINATION

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/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/training-courses/full-catalogue/fifth-generation-5g-implementation-practices-and-case-studies-0>

You can also register by finding your desired course in our training catalogue <https://academy.itu.int/training-courses/full-catalogue>.

Payment

1. On-line payment

A training fee of **USD 150** 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/training-courses/full-catalogue/fifth-generation-5g-implementation-practices-and-case-studies-0>

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-ASP- 210I26547ASP-E - P.40593.1.10

4. Other Method of Payment

For local participants who would like to pay in local currency, training fee of **MYR 650** can be made directly to Universiti Teknologi Malaysia bank account as follow,

1. Account Name: BENDAHARI UTM
2. Account no: 8006053536
3. Bank Name: CIMB Bank Berhad
4. Payment Reference: Invoice Number (Kindly request local invoice from UTM secretariat).