



ITU CENTRES OF EXCELLENCE NETWORK FOR ASIA PACIFIC REGION

Online Training Course on “Human Exposure to Radio Frequency Electromagnetic Fields ” 23 November -6 December 2020

COURSE OUTLINE

COURSE DESCRIPTION

Title	Human Exposure to Radio Frequency Electromagnetic Fields
Method of delivery	Online Instructor Led
Objectives	<p>Wireless devices consist of antenna that emits electromagnetic wave, which is exposed to the user’s body. This exposure to human raises concerns on the adverse health effect. Thus, it is important to understand the effect to human due to this exposure and related policies. The training course is designed;</p> <ul style="list-style-type: none">• To equip participants with an understanding of the effect of radio frequency electromagnetic field (EMF) exposure to human and its relation to body tissue dielectric parameters and frequency;• To build knowledge to participants with the recent studies on the effect of EMF exposure to human;• To equip participants with an understanding of EMF radiation from 5G network infrastructure• To equip participants with practical EMF measurement techniques and introduction to related equipment;• To equip participants with an understanding of related policies on human exposure to EMF;• To expose participants on the public education strategy related to EMF exposure and health concern;• To introduce Wearable Technology to participants with the recent studies on the effect of EMF exposure on Wearable Technology;
Dates	23 rd November to 6 th December 2020
Duration	2 weeks
Registration deadline	20 th November 2020
Training fees	International Participants: USD 300 per participant Local Participants: MYR 1,300 per participant
Course code	200I24867ASP-E

LEARNING OUTCOMES

Upon completion of this training, participants will be able to

- understand the EMF exposure effect to human
- relate the EMF exposure effect to parameters correlated to human body and antenna
- gain awareness of the EMF related policies, including the latest development in 5G policies and compliance
- discuss the recent studies on the effect of EMF exposure to human
- get exposure of public education related to EMF exposure

TARGET POPULATION

This short course will bring together leading specialists in the field; executives, managers, officials, engineers, employees from policy makers, regulators, government organisation, telecom operators, vertical industries, telecom investment companies, researchers and academia. Other institutions and individuals are also welcome to participate.

FACILITATOR/EXPERTS

The experts for the training include experts from UTM, ITRC and invited industry speakers.

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

Date and Time (Kuala Lumpur Time Zone GMT+8)	Module	Scope/Activity
23 Nov 2020 (Mon) 2.30pm to 4.30pm	1. Introduction to EMF and Source of Radiation By Prof Dr. Jafri Din, UTM	<ul style="list-style-type: none"> • The electromagnetic spectrum • Radio frequency (RF) electromagnetic field • Ionizing and non-ionizing radiation • Overview of antenna and its characteristics • Field region: near field and far field • Antenna arrays • Human exposure to EMF: near field vs far field
24 Nov 2020 (Tue) 2.30pm to 4.30pm	2. Devices, Base Stations, Broadcasting Stations and Power Density By Assoc. Prof. Dr. Razali Ngah, UTM	<ul style="list-style-type: none"> • How mobiles and wireless devices work ? • How broadcasting stations work? • Towers and antennas • Mobile base station and broadcasting station radiated power • Broadcasting station radiated power • Wireless devices radiated power • Power density and its relation to EMF emission • How power density varies? • The importance of power density value
25 Nov 2020 (Wed)- 2.30pm to 4.30pm	3. Wireless Devices and SAR By Assoc. Prof. Dr. Norhudah Seman, UTM	<ul style="list-style-type: none"> • Body tissue dielectric parameters • Specific absorption rate (SAR) and its relation to EMF exposure to human • How SAR varies? • The importance of SAR value • Overview of SAR simulation and measurement • Virtual tour to SAR Laboratory UTM
26 Nov 2020 (Thu)- 2.30pm to 4.30pm	4. EMF Policies, Guidelines and Standards: By Mr. Aamir Riaz, ITU	<ul style="list-style-type: none"> • Overview of International Organizations involved in EMF related activities <ul style="list-style-type: none"> - ITU (ITU-D, ITU-R and ITU-T Study Group activities on EMF) - ICNIRP - WHO - IEEE • Safety factors • ITU standards, reports and guidelines • Report ITU-D Question 23/1, Question 7/2 • ITU-R Handbook - Spectrum Monitoring • ITU-R Report SM.2452
27 Nov 2020 (Fri)	Quiz I (30%)	<ul style="list-style-type: none"> • Participants to log in ITU Academy course page to attempt Quiz I

Date and Time (Kuala Lumpur Time Zone GMT+8)	Module	Scope/Activity
30 Nov 2020 (Mon) 2.30pm to 4.30pm	5. Recent Development in 5G EMF Policies, Guideline, Radiation Measurement and Monitoring By Mr. Anwar Faizd Osman, Vice Chair, IMT and Future Network Working Group Malaysia.	<ul style="list-style-type: none"> • Overview of 5G antenna and power radiation technology • Case studies on recent development of 5G EMF exposure policies, guideline and standards at various countries • Differences of 5G EMF radiation measurement as compared to legacy 2G, 3G and 4G mobile technologies. • Demonstration on 5G EMF measurement platform • Case study of 5G EMF measurement from actual 5G sites
1 Dec 2020 (Tue) 2.30pm to 4.30pm	6. Public Education Strategy on EMF Exposure and Public Health Concerns By Mr. Chua Tien Han, UTM	<ul style="list-style-type: none"> • Overview of public education strategy on educating the public regarding facts • Myths of EMF exposure and its impact on public health • Case study
2 Dec 2020 (Wed) 2.30pm to 3.30pm	7. EMF Monitoring Case Study: Iran Communications Regulatory Authority (CRA) By CRA	<ul style="list-style-type: none"> • Experience of Iran Communications Regulatory Authority (CRA) in cumulative electromagnetic wave intensity monitoring system.
2 Dec 2020 (Wed) 3.30pm to 4.30pm	8. EMF Related R&D by Iran Telecommunication Research Centre (ITRC) By ITRC	<ul style="list-style-type: none"> • Summary of Design, simulation and implementation of cumulative electromagnetic wave intensity measurement and monitoring system: <ul style="list-style-type: none"> - Electromagnetic Field Probes: <ul style="list-style-type: none"> - Electric Field Probes - Magnetic Field Probes - Cellular Network Probe - Measurement Base Unit - Calibration techniques - Test bed and experimental equipment • Server and Monitoring system
3 Dec 2020 (Thu) 2.30pm to 3.30pm	9. Virtual Field Visit to Laboratory of Electromagnetic Intensity Measurement and Monitoring system By ITRC	<ul style="list-style-type: none"> • Practical review of : <ul style="list-style-type: none"> - Electromagnetic Field Probes hardware - Measurement Base Unit hardware - Calibration Set ups review - Test bed and experimental Setups • Practical Measurement and Monitoring of selected Electromagnetic Fields
4 Dec 2020 (Fri)	Quiz II (30%)	<ul style="list-style-type: none"> • Participants to log in ITU Academy course page to attempt Quiz II.
6 Dec 2020 (Sun)	Assignment submission (10%)	Participants to log in ITU Academy course page to access the materials and attempt the assessment and to submit the assignment

METHODOLOGY

The online 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 elearning 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.

Assignment shall be uploaded to the elearning website before the due date.

All official announcements will be made through the Announcement Forum in the elearning course page.

COURSE COORDINATION

ITU coordinator:

Mr. Sean Doral

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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 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/human-exposure-radio-frequency-electromagnetic-fields-malaysia>

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 300** 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>)

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 300
Payment Reference:	CoE-ASP- 24867- P.40593.1.10

4. Other Method of Payment

For local participants who would like to pay in local currency, training fee of **MYR 1,300** 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).