ITU CENTRES OF EXCELLENCE NETWORK FOR ASIA PACIFIC REGION

Face to Face Training Course on

"Human Exposure to Radio Frequency Electromagnetic Fields "

3-5 December 2019

KSL Resort Johor Bahru City Centre, Johor Bahru, Malaysia

COURSE OUTLINE

COURSE DESCRIPTION

Title	**Human Exposure to Radio Frequency Electromagnetic Fields**
Method of delivery	Face-to-face
Objectives	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; • 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 equip participants with an understanding of related policies on human exposure to EMF; • To build knowledge to participants with the recent studies on the effect of EMF exposure to human; • To expose participants on the public education related to EMF exposure
Dates	3 to 5 December 2019
Duration	Three days
Registration deadline	15th November 2019
Training fees	International Participants: USD 550 per participant Local Participants: MYR 2,300 per participant
Course code	**19WS24420ASP-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 related policies
- 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 Prof. Dr. Tharek Abd Rahman, Prof. Dr. Jafri Din, Assoc. Prof. Dr. Norhudah Seman from UTM and invited speakers from ITU and industry.

EVALUATION

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

Evaluation Parameter	**Weightage (in %)**
Post-Training Assessment	60 %
Attendance	20 %
Participation in Case Studies and Group Activities	20 %

The minimum passing requirement for certificate is 60%.

Day 1		
Time	**Topics**	**Scope**
8.00-9.00	Registration	
9.00-9.30	Pre-Training Assessment	
9.30-10.30	Introduction to EMF	a. The electromagnetic spectrum b. Radio frequency (RF) electromagnetic field Ionizing and non-ionizing radiation
10.30-11.00	Tea Break	
11.00-12.30	EMF and Health Overview	a. Mobile phones and health b. Base stations and health c. Broadcast stations and health d. Human Exposure to EMF e. Effect of EMF f. Body tissue dielectric parameters
12.30-14.00	Lunch break	
14.00-15.30	Wireless Devices, Base Stations, Broadcasting Stations	a. How mobiles and wireless devices work ? b. How broadcasting stations work? c. Towers and antennas d. Mobile base station radiated power e. Broadcasting station radiated power f. Wireless devices radiated power
15.30-16.00	Tea Break	
16.00-17.00	Base stations and Power Density	a. Power density and its relation to EMF emission b. How power density varies? c. The importance of power density value d. Simulation and measurement of power density

Day 2		
Time	**Topics**	**Scope**
9.00-10.30	EMF Policies, Guidelines and Standards Part 1	a. Overview of International Organizations involved in EMF related activities - ITU (ITU-D, ITU-R and ITU-T Study Group activities on EMF) - ICNIRP - WHO - IEEE b. Safety factors c. ITU standards, reports and guidelines - ITU- T SG5 Q3/5 - ITU-T K.52 - ITU-T K.61 - ITU-T K.70 - ITU-T K.83 - ITU-T K Suppl.9 - ITU-T K Suppl.14 d. Group Discussion and Case Study
10.30-11.00	Tea Break	
11.00-12.30	EMF Policies, Guidelines and Standards Part 2	a. ITU standards and guidelines - ITU-T K.90 - ITU-T K.91 - Rec. ITU-R BS.1698 b. Report ITU-D Question 23/1, Question 7/2 c. ITU-R Handbook - Spectrum Monitoring d. ITU-R Report SM.2452 e. Group Discussion and Case Study
12.30-14.00	Lunch Break	
14.00-15.00	Wireless Devices and SAR	a. Specific absorption rate (SAR) and its relation to EMF exposure to human b. How SAR varies? c. The importance of SAR value d. Overview of SAR simulation and measurement
15.30-16.00	Tea Break	
16.00-17.30	Laboratory Session on SAR Simulation and Measurement (Field Visit to UTM SAR Lab)	a. SAR simulation using 3D EM software with human model b. SAR measurement of selected device under test (DUT) c. Group discussion
19.00-21.00	Social Event	Group Dinner

Day 3		
Time	**Topics**	**Scope**
9.00-10.30	Recent studies on the EMF exposure to human	a. Recent studies at low frequencies b. Recent studies at high frequencies c. The challenges of 5G
10.30-11.00	Tea Break	
11.00-12.30	Case study and public education	Case studies and public education campaigns in Malaysia and countries in Asia Pacific.
12.30-14.00	Lunch Break	
14.00-15.30	Discussion on public education	Group discussion based on the problem related to public education
15.30-16.00	Tea Break	
16.00-16.30	Conclusion	Summary of human exposure to radio frequency electromagnetic fields (EMF)
16.30-17.00	Post-Training Assessment	
End of Training Programme		

METHODOLOGY

The face-to-face training course will include:

- Instructor-led presentations,
- Case studies,
- Group discussions,
- Demonstrations

COURSE COORDINATION

ITU coordinator:

Mr. Aamir Riaz
Tel. +62 21 380 2321 / 380 2324
Fax +62 21 3890 5521
E-mail: aamir.riaz@itu.int

Universiti Teknologi Malaysia's Coordinator

Dr. Bruce C. Y. Leow
Course Coordinator, Wireless Communication Centre, UTM.
Tel: +607-5536087 Fax: +607-5535252
Email: bruceleow@utm.my

Ms. Jamaliah Binti Salleh
Secretariat, Wireless Communication Centre, UTM.
Tel: +6013-7694612 Fax: +607-5535252
Email: jamaliah_s@utm.my

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

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 550** 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/human-exposure-radio-frequency-electromagnetic-fields

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 550
Payment Reference:	CoE-ASP- 19WS24420ASP-E- P.40593.1.10

4. Other Method of Payment

For local participants who would like to pay in local currency and claim for HRDF, training fee of **MYR 2,300** 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).