



5G, Millimeter Wave Antennas: Beamforming, Propagation and Test

Training Programme
by
Faculty of Engineering
Multimedia University

Overview

This two-day course offers participants with coverage of wireless system antenna elements, phased antenna array, link budget, propagation, integration and test topics related to millimeter wave and 5G applications. The course offers a basic understanding of antenna fundamentals, antenna property and considerations, antenna types and millimeter wave propagation. The course provides information on how antenna and propagation affect the communication systems. Topics also include how to test and measure millimeter wave antenna performance and information on phased antenna arrays and beam steering concepts.

Objective

- Understand the concepts associated with antenna operation, classification and performance.
- Identify and understand antenna types.
- Implement antenna phased arrays using basic principles.
- Evaluate the antenna performance and the millimeter wave propagation.

Target Audience

The course is well suited for those who require an understanding of antenna fundamentals and millimeter wave concepts.

Prerequisite

An electronics engineering background or equivalent practical knowledge is recommended but not required.

Training Methodology

Classroom, hands-on lab work and exercises.

Course Duration

2 days.

Content/Outline

RF Concepts

- Overview of a wireless communication system.

Antenna Concepts

- Antenna properties - impedance, VSWR, bandwidth, directivity, gain, radiation patterns, polarization, etc.

Antenna Elements

- The Dipole • The Loop • Microstrip Antennas

Type of Antennas

- Antenna aperture • The horn antenna • The reflector antenna

Phased Arrays

- Array theory • Feed network design considerations • Beam steering concepts

Millimeter Wave Propagation

- Friis Equation • The communication link • Path loss • Receiver Sensitivity and antenna noise figure • Link budget calculations • Atmospheric Loss • Rain Attenuation

Special Considerations for 5G mm-Wave versus 4G/5G LTE

- Propagation • Antenna differences • Base station difference • Implementation differences in handheld devices • System operation

Antenna Testing

- Antenna Ranges • Far-field Testing • Near-Field Testing • Test and measurement of antenna performance

Course Instructors

Ir. Dr. Tiang Jun Jiat

Ir. Dr. Tiang Jun Jiat is currently a Senior Lecturer in the Faculty of Engineering at the Multimedia University. He has been conducting undergraduate and postgraduate lectures, tutorials and laboratory experiments in electronic and electromagnetic subjects. His research interests lie in the areas of microwave engineering, the application of electronic devices in telecommunications and antenna propagation. Furthermore, he has provided short courses and training for the topics of microwave, antenna, electromagnetic interference (EMI) and radio frequency identification (RFID).

Administrative Details

Programme Logistics

Duration: 2 days

Dates, registration deadline and registration form:

Please refer to: <https://www.mmu.edu.my/foe/short-courses/>



Your Investment

	Condition	Price per Pax
Regular Fee	Students / MMU Alumni	RM600
	Public	RM1000
	Public (Group >5 pax)	RM900
	IEM/IEEE Members	RM900
Early Bird Fee	Students / MMU Alumni	RM400
	Public	RM800
	Public (Group >5 pax)	N/A
	IEM/IEEE Members	RM700

Method of Payment

Please refer to the next page.

Type of Payment	Method	Details
Local Transaction / Payment within Malaysia	Online Payment with JomPay	<ul style="list-style-type: none"> To get started, login to any preferred internet banking. Look for JomPay to begin the payment process. Enter Ref 1 & Ref 2. <div style="border: 1px solid black; padding: 5px; display: inline-block;">  Billor Code : 22202 Ref-1 : <Participant IC/Passport> Ref-2 : Event Name* </div> <p>JomPAY online at Internet and Mobile Banking with your Current, Savings or Credit Card account</p> <p>*Ref. 2: FOE5GMM</p>
		<ul style="list-style-type: none"> To get started, go to MMU website (https://www.mmu.edu.my/) > Admission > Financial Info > Payment Channel > Non Student ; <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> <p>E-Payment To begin the payment process, please click Student or Non Students</p> <p>  </p> <p>Student Non-Student</p> </div> <p>or scan the QR code below to begin the process:</p> <div style="text-align: center;">  <div style="background-color: black; color: white; padding: 5px; display: inline-block; font-weight: bold; font-size: 1.2em;">SCAN ME</div> </div> <ul style="list-style-type: none"> Choose Category: Public Training Workshop Name Choose Your Participant Type: <ul style="list-style-type: none"> ✓ STUDEN (MMU, IEEE, IEM, Other Higher Learning Institution) ✓ PUBLIC ✓ GROUP (Group > 5 Pax) ✓ IEEE/M (IEEE/IEM Members)

Type of Payment	Method	Details
International Payment / Payment outside Malaysia	Online payment with Flywire 	<ul style="list-style-type: none"> To get started, go to mmulanding.flywire.com; or scan the QR code to begin the payment process: <div style="text-align: center;">  </div> <ul style="list-style-type: none"> Choose Conference for Non-students related

Note:

Please submit the proof of payment to organizer for clearance updating purposes within 2 working days.

Refund and Cancellation

Any refunds will be processed in 60 days. Should there be any cancellation, it may be due to the organizer not getting the minimum participants or the participant failing to attend the workshop due to unavoidable reason.

Disclaimer

Faculty of Engineering, Multimedia University reserves the right to change the instructors, date and to vary/cancel the programme should unavoidable circumstances arise. All effort will be taken to inform participants of the changes. Upon submission of the registration form, you are deemed to have read and accepted the terms.

Enquiries

Dr. Zubaida Yusoff: zubaida@mmu.edu.my

Ms. Sherry Dalilla Abd. Rahim: dalilla.rahim@mmu.edu.my