

# Practical Antenna Design

3-Day Practical Training : from Initial Specification to Final Testing



## Practical Antenna Design

Antenna is an essential component of all equipment that uses radio frequency (RF). Today, antennae are used everywhere ranging from complex systems such as communication satellites, radars, GPS, TV broadcasting, to consumer devices such as cell phones, garage door openers, wireless mouse, RFID tags and so on. This course is aimed to provide a useful guide on the basics of antennae with special emphasis on practical antenna design, simulation, prototyping and measurements. Design examples of modern antennae will be discussed and shown from initial specifications to a final workable prototype – all without complicated mathematical formulae!

## About Go Training

Go Training applies effective pedagogical methodologies that demonstrate case studies and hands-on practical skills, in addition to explaining clearly how things work in principle. Every course that we conduct is delivered by a subject matter expert who holds the academic qualification and working experience in that specialization. On the days when they are not teaching, our trainers work on consultancy projects and technical deliveries. Their work has received numerous recognition and awards in the industry. Our team of trainers has been invited as keynote speakers at numerous international conferences, and as principal consultants for various industries.

Date: 23 – 25 November 2015  
(Monday - Wednesday)  
Time: 0900 - 1700  
Venue: Kuala Lumpur, Malaysia.

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### Course Outline

#### Day 1

##### Antenna Basics

- Types of antennas
  - Wire vs. aperture
  - Self-resonating vs. non-self-resonating
- Antenna parameters
  - S-parameter, VSWR, antenna bandwidth, resonance frequency
  - Far field, directivity, gain, radiation impedance, antenna pattern, polar plot, Cartesian plot, polarization, efficiency
- Analyzing antenna parameter from Smith Chart
- Matching networks and balun
- Antenna examples and applications

#### Day 2

##### Practical Antenna Design

- Workflow for practical antenna design
  - Theory and working principle
  - Simulation
  - Prototyping / fixturing
  - Measurement
- Tools and laboratory supplies for antenna design work

##### Antenna Design Examples – Part 1

- Wire antenna for wireless communication
- Dipole antenna/Yagi for base stations

Hands-on: Antenna design case study

#### Day 3

##### Antenna Design Examples – Part 2

- Monopole antenna for land mobile radio applications
- PIFA antenna for mobile phone application
- HF RFID tag @ 13.56MHz

##### Practical Antenna Measurement

- Antenna chamber
- 2D vs. 3D antenna chamber
- Measurement equipment
  - Vector network analyzer, site master, SWR meter, MFJ antenna analyzer

Hands-on: Measuring various types of antennas

### About the Instructor

Mr Por Chee Seong graduated from The Queens' University of Belfast, Northern Ireland in 1993 with M.Sc in Electronics Engineering, majoring in Microwaves and Telecommunication.



Mr Por started his career in 1994 as a Research & Development design engineer, specializing in receiver design. In his 19 years of experience, he has successfully set up 2 R&D departments for antenna design. He is currently an RF Engineering Manager in Laird Technologies, leading a team of RF engineers doing antenna design for wireless portable devices, base stations, in-building wireless, machine-to-machine (M2M) applications and land mobile radio applications. Mr Por has successfully filed a joint utility patent titled "Current Comparator Automatic Output Control". In 2008, he was elected as Chairperson for Portable Antennas session for International Symposium on Antennas and Propagation. He is also an active licensed Class-B Amateur radio operator.

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No. 36, Jalan IMJ 1, Taman Industri Malim  
Jaya, 75250 Melaka, Malaysia.  
t +606 336 6016  
f +606 252 3059  
w [www.gotraining.com.my](http://www.gotraining.com.my)  
[f] [fb.com/gotraining.com.my](https://fb.com/gotraining.com.my)  
[in] [linkedin.com/company/gotraining](https://linkedin.com/company/gotraining)

To register, please contact:  
m +6010 663 1852  
e [yiwei@gotraining.com.my](mailto:yiwei@gotraining.com.my)