

# 3-Day Practical Training on Electronic Instrumentation and Control

## Course Overview

Electronic measurements are essential for use in various stages of product development, which include circuit design verification, troubleshooting, quality control, as well as failure analysis. Instrumentation control is a PC-based approach that provides connectivity for automating measurement acquisition from instrumentation. This course highlights the fundamentals of electronic measurement and instrument control, and provides hands-on exercise on how to use various types of basic instruments.

## Who will benefit from this course

This course is specially designed for *technicians* and *engineers* interested in

Basics of electronic instrumentation

- Practical measurement techniques
- Instrumentation control
- Exposure to usage of measurement equipments
- Exposure to usage of instrument programming tools
- Instrument control of National Instruments devices

## Course Outline

### Day 1 Basic Instruments

Measurement Fundamentals

- Overview of basic electronic instruments
- Measurement quality
- Measurement uncertainty and calibration

DC Power Supply and Digital Multi-Meter (DMM)

- What exactly is a DC power supply
  - Overview of digital multi-meter
  - Measurement using digital multi-meter
- Hands-on Session: DC Power Supply and Digital Multi-Meter

Arbitrary Waveform Generator (AWG) and Digitizer

- Overview of AWG
  - Low frequency signal generation using AWG
  - Time-domain measurement using modern digitizer
- Hands-on Session: Time-Domain Measurement

### Day 2 Advanced Instruments

Vector Signal Generator and Vector Signal Analyzer

- High frequency signal synthesis
  - Frequency domain measurement using signal analyzer
- Hands-on Session: Frequency-Domain Measurement

Vector Network Analyzer

- VNA fundamental
  - VNA measurement
  - Time-domain analysis
- Hands-on Session: VNA Measurement

### Day 3 Control and Automation

Instrument Control

- Overview of instrument control
  - Hardware connectivity: GPIB, USB, Ethernet, Serial
  - Application and driver software
- Hands-on Session: Instrument control

Measurement Automation

- Overview of measurement automation
  - Measurement automation using instrument control
- Hands-on Session: Measurement Automation

## Public Training Session

Open for registration

**Date:** 19<sup>th</sup> - 21<sup>st</sup> May, 2014

**Time:** 0900 - 1700

**Venue:** National Instruments Academy and Innovation Nucleus (NI-AIN)  
Level 1 & Level 2, MASTER Center,  
Technology Park Malaysia,  
Lebuhraya Puchong-Sg.Besi, Bukit Jalil,  
57000 Kuala Lumpur

This public training is HRDF (PSMB) claimable.

Register by 7<sup>th</sup> April 2014 to enjoy early bird discount.

Certificate will be awarded to participants who complete the training.

Lunch, refreshments and training handout provided and included.

Transportation and accommodation not included.



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## About the Instructors

**Mr Chai Ched Chang** received his B.Eng (Hons) from University of Malaya, and M.EngSc from Multimedia University, Malaysia. Mr Chai began his career as a Signal Integrity engineer in 2001, specialized in designing High Speed PCB. He had delivered many consumer electronics PCB designs, where he is specifically experienced in analyzing signal quality issues associated with high-speed memory (SDRAM, DDR, DDR2, DDR3), differential signaling (LVDS, HDMI, USB, PCI Express, Ethernet), and other digital interfaces (FPGA interface, FLASH memory, Video bus, ADC & DAC). He also has vast experience in high speed signal simulation and electronics instrumentation. In 2012, Mr Chai left his former company as Chief Technical Officer, and started his own company. With 15 years of combined experience in both research and industry, he continues to strive to provide the best signal analysis advice to his clients.



**Mr. Chua Ming Yam** graduated with M. Eng. Sc in 2007 from Multimedia University Malaysia. He received his first degree B. Eng. (Hons) Electronics from the same university in 2003. Upon graduation, he embarked on his research career in Multimedia University. He is currently a senior lecturer and pursuing his PhD. He has accomplished numerous projects in Field Programmable Gate Array (FPGA), specializing in digital design using Verilog HDL. His current PhD research topic is on real-time radar signal synthesis using FPGA. Other than that, he is also specialized in RF test and measurement, and PCB design. During his 10 years career, he has published 6 international journal papers and successfully filed a patent. He is also a Certified LabView Associate Developer (CLAD).



## SPECIALIZED TRAINING EXPERIENTIAL LEARNING



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