*Chairman,*
*Chemical Engineering Technical Division,*
*The Institution of Engineers Malaysia,*
*Lots 60 & 62, Jalan 52/4, P.O. Box 223 (Jalan Sultan),*
*46720 Petaling Jaya, Selangor Darul Ehsan*
*Fax: 03-7957 7678 Email: meitzy@iem.org.my*

## REGISTRATION FORM

Contact Person: _____ Designation:_____

Name of Organization: _____

Address: _____

_____

Telephone No.: _____ (O) _____ (Fax)

_____ (H) _____ (HP)

Email: _____

_____ _____
Signature & Stamp Date

***Fees MUST be fully paid a WEEK BEFORE the commencement of the course. Bookings by fax from outstations MUST be forwarded with payments at least a WEEK BEFORE the day of the course. Seats could only be confirmed upon payment.**

Enclosed herewith a crossed cheque No: _____for the sum of RM _____ issued in favour of "**The Institution of Engineers, Malaysia**" and crossed 'A/C payee only'. I/We understand that the fee is not refundable if I/We withdraw after my/our application is accepted by the Organising Committee as stated in the **cancellation term**. If I/We fail to attend the seminar, the paid registration fee will not be refunded.

**FULL PAYMENT must be settled before commencement of the course**, otherwise participants will NOT be allowed to enter the hall. If a place is reserved and the intended participants fail to attend the course, the fee is to be settled in full. If the participant failed to attend the course, the fee paid is non refundable. Registration fee includes lecture notes, refreshment and lunches.

For **ONLINE REGISTRATIONS**, please note that payment **MUST** be made **BEFORE CLOSING DATE**. If payment is not received within the stipulated time, the registration fee will be reverted to the normal registration fee.

*The Institution of Engineers, Malaysia*

## 2-Day Course On

# QUALITY IMPROVEMENT VIA STATISTICAL PROCESS CONTROL

***Organised By:***

**Chemical Engineering Techincal Division, IEM**

**Date : 5 & 6 Dec 2011 (Monday & Tuesday)**
**Venue : TUS Lecture Room, 2nd Floor, Wisma IEM**
**Time : 9.00 am - 5.00 pm**

***Attention:***
*Participants are required to bring their own laptop with Microsoft Excel for the working session.*

**BEM Approved**
**PDP/CPD Hours = 13**
**Ref. No: IEM11/HQ/288/C**

**Registration Fees:**

| | EARLY BIRD SPECIAL (until 1 Nov 2011) | | NORMAL FEES (2 Nov - Dec 2011) | |
|---|---|---|---|---|
| | Normal Rate | Online Rate | Normal Rate | Online Rate |
| IEM Student Members | RM220.00 | RM200.00 | RM650.00 | RM600.00 |
| IEM Graduate Members | RM400.00 | RM380.00 | RM650.00 | RM600.00 |
| IEM Corporate Members | RM590.00 | RM560.00 | RM750.00 | RM700.00 |
| Non IEM Members | RM980.00 | RM930.00 | RM950.00 | RM900.00 |

**Closing Date : 1 December 2011 (Thursday)**
***No Online Registration will be allowed after the Closing Date.***

## Objective

Statistics are tools used to make predictions on performance. There are a number of simple methods for analysing data and, if applied correctly, can lead to predictions with a high degree of accuracy. Statistical Process Control, SPC is a branch of applied statistics for quality control. It is statistical analysis of the predictability and capacity of a process to give a uniform product. SPC is a popular industry tool for the collection, analysis and interpretation of data for use in quality control activities. This module covers the basic concepts of statistical analysis and their application to practical problems in process control.

The concept of SPC is then further extended for multivariate process. Multivariate Statistical Process Control, MSPC procedures allow production personnel to simultaneously observe several variables on one consolidated chart. Second part of the workshop focuses on multivariate extensions for all kinds of univariate control charts, such as multivariate control charts. In addition, we review unique procedures for the construction of multivariate control charts, based on multivariate statistical techniques such as principal components analysis (PCA) and Hotelling's T2 method.

This module aims to build fundamental knowledge and skills required in statistical process control and quality improvement. Participants will learn basic concepts of applied statistics in process and quality control as well as the hands-on knowledge of the application of statistical process control in the process industry.

The workshop will introduce you to the following topics:

i. Understand the Concepts of Quality Improvement
ii. Apply the Fundamentals of Statistics
iii. Draw and apply the Control Charts
iv. Plot and implement the Control Charts
v. Extract the Acceptance Sampling
vi. Interpreting Control Charts
vii. Create multivariate models of process data with PCA method
viii. Multivariate data charting techniques
ix. Decompose a multivariate signal with Hotelling's $T^2$ method
x. Process fault detection and diagnosis

## Biodata of Speaker

**Engr. Dr. Lam Hon Loong, is an Assist. Professor with University of Nottingham, Malaysia Campus. He pursued double PhD in Chemical Engineering, 2010 (University of Maribor, Slovenia) and Information Technology, 2011 (University of Pannonia, Hungary). His research topics are process quality control and supply chain synthesis. He has completed his Bachelor Degree, 2000 and Master Degree, 2004 in Chemical Engineering, both from Universiti Teknologi Malaysia with specialisation in process system engineering.**

**Engr. Dr. Lam has more than 10 years experience in Statistical Process Control with several publications and industrial projects. Dr Lam is also active in several international scientific committee for example the guess editor for the international Journal of ENERGY, Journal of Cleaner Production, Clean Technologies & Environmental Policy and Chemical Engineering Transaction. He is also the scientific secretary for an international conference (Conference on Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction - PRES) since 2007.**

## Course Program

| 5 Dec 2011 | Monday |
|---|---|
| 08.30am - 09.30am | Registration |
| 09.30am - 10.30am | **Concepts of Quality Improvement**<br>- The meaning of quality and quality improvement<br>- A brief history of quality control<br>- Statistical method for quality control |
| 10.30am - 10.45am | *Break* |
| 10.45am - 12.15pm | **Fundamentals of Statistics and Control Charts**<br>- Fundamentals of Statistics<br>- Fundamentals of Probability<br>- Control charts for variables<br>- Control charts for attributes |
| 12.15pm - 13.00pm | *Lunch* |
| 13.00pm - 15.15pm | **Extracting the Acceptance Sampling & Plotting the Control Charts**<br>- Statistical Aspects<br>- Acceptance sampling pans<br>- Control Charts plotting |
| 15.15pm - 15.30pm | *Break* |
| 15.30pm - 17.00pm | **Implementing SPC in Industry**<br>- Discussion and working session |
| **6 Dec 2011** | **Tuesday** |
| 09.00am - 10.30am | **Review of SPC and It's Applications Introduction to the Multivariate Process**<br>- Univariate Vs. Multivariate<br>- Examples |
| 10.30am - 10.45am | *Break* |
| 10.45am - 12.15pm | **Fundamentals of Multivariate Statistics and Multivariate Control Charts**<br>- Fundamentals of Multivariate Statistics<br>- Principal Component Analysis, PCA Models<br>- Multivariate Control Charts |
| 12.15pm - 13.00pm | *Lunch* |
| 13.00pm - 15.15pm | **Hotelling's $T^2$ method**<br>- Introduction<br>- Working session |
| 15.15pm - 15.30pm | *Break* |
| 15.30pm - 17.00pm | **MSPC for Process Fault Detection and Diagnosis**<br>- Case study-Group discussion |
| | **Question and Answer** |