

## Course Lecturer



**Goh Thong Ngee** is Professor of Industrial & Systems Engineering at the National University of Singapore. He obtained his BE from the University of Saskatchewan, Canada and PhD from the University of Wisconsin-Madison. Prof Goh

has been internationally recognized for his expertise in quality engineering and management; he has been elected Fellow of the American Society for Quality as well as Academician of the International Academy for Quality.

A registered professional engineer and a GE-certified Six Sigma instructor, Prof Goh has three decades' track record in teaching, research as well as consulting and training in a wide spectrum of industrial organizations. He has trained numerous working engineers in statistical methodologies such as design of experiments, and has brought up more than a thousand Six Sigma and DFSS (Design for Six Sigma) Champions, Master Black Belts, Black Belts and Green Belts in countries in the Asia Pacific.

Prof Goh has published widely. In addition to serving on the editorial boards of several leading international professional and research journals, e.g. *Quality and Reliability Engineering International*, *International Journal of Reliability, Quality and Safety Engineering*, *International Journal of Production Economics* and *The TQM Magazine*, he is also an Associate Editor of *Quality Engineering Journal* of the American Society for Quality, as well as a member of the Founding Editorial Board of the *International Journal of Six Sigma and Competitive Advantage*.

## REGISTRATION - 2 Easy Ways to Register!!

MAIL or FAX to:



Professional Activities Centre  
Faculty of Engineering  
National University of Singapore  
9 Engineering Drive 1  
Blk EA #05-34 Singapore 117576  
Fax: (65) 6874 5097 Tel: +65 6874 5113

**Enquires :** Please contact Anna Robinson for more information at Tel: (65) 6874 5113 or e-mail: [engannar@nus.edu.sg](mailto:engannar@nus.edu.sg)

**Fee :** Singapore participants SGD 1,450 + SGD 72.50 (GST 5%)  
Overseas participants SGD 1,450 (GST exempted)

**Payment :** Payment is required prior to the course. Crossed cheques should be made payable to "National University of Singapore" and mailed together with the registration form to the mentioned address.

**Discount :** Maximum of 10% discount is applicable to:

- Employees of the NUS Technology Associates registered with INTRO (Industry and Technology Relations Office);
- NUS Alumni
- Organisations / Companies sending three or more participants.

### Refunds and Cancellations :

A 50% refund will be made for withdrawals (received in writing) ten working days before the commencement of the course. No refunds will be made thereafter. However, a replacement will be accepted upon prior arrangement at no extra cost. Please inform us of the changes, if any, by fax. The Professional Activities Centre reserves the right to cancel the course and fully refund the participants, should unforeseen circumstances warrant it. Every effort will be made to inform participants of any changes.



## Optimization of Industrial Processes via Design of Experiments and Quality Engineering

(PE Board Accredited PDUs = 28 units)

by

**Professor Goh Thong Ngee**  
Industrial & Systems Engineering  
National University of Singapore

Date : 26 – 29 April 2005  
Time : 9am – 5pm  
Venue : NUS, Kent Ridge Crescent

**Organised by:**  
Professional Activities Centre  
National University of Singapore  
Faculty of Engineering

**Website :** <http://www.eng.nus.edu.sg/PACentre/>

## Course Overview

This course aims to impart to engineers and technical managers up-to-date and practical statistical tools for efficient data collection and analysis for the purpose of process capability improvement, yield maximization, rapid trouble shooting, cycle time reduction, and effective R&D.

Topics ranging from basic Design of Experiments to Taguchi Methods and Six Sigma concepts will be covered, featuring the most effective industry-proven approaches to quality excellence.

Participants will also be shown the working of commonly available software packages for designing and analyzing experiments. The approach and tools discussed are generic and are not specific to any industry.

No prior knowledge in Statistics or statistical software is assumed on the part of the participants but familiarity with Microsoft Windows is useful.

## Target Audience

Engineers, engineering assistants as well as technical managers in product, process, testing, quality, and R&D.

This course is specifically designed to be application oriented, stressing practical reasoning and procedures appropriate to industrial situations. During interactive sessions, participants are encouraged to bring up topics and issues that are of particular interest in their areas of work.

## Course Outline

### Day 1: Basic Ideas and Procedures

Statistical approach to Quality and reliability  
From SPC to Quality Engineering and Six Sigma  
Why and how of Design of Experiments  
Multi-factor studies in industry  
Factor definition and selection  
Main and interaction effects  
Input-output relationships

### Day 2: Advanced Techniques

Detection of non-linear effects  
Efficient screening of factors  
Interpretation of fractional factorials  
Confounding analysis and resolution  
Strategies for sequential experimentation  
Rapid troubleshooting and testing  
Application of cost-effective experiments

### Day 3: Practical Applications

Multi-input, multi-output analysis  
Integration with FMEA and QFD  
Small sample experiments  
Optimization under constraints  
Variance reduction principles  
Taguchi Methods: special features  
Multi-level experimental design and analysis

### Day 4: Further Applications

Potential and limitations of Taguchi Methods  
Robust Design for products and processes  
Manufacturing and environmental noise management  
Response surface methodology  
Sensitivity analysis for an optimized process  
Seeking and tracking optimal conditions  
Software applications  
DOE projects  
Case studies

## REGISTRATION FORM

### Optimization of Industrial Processes via Design of Experiments and Quality Engineering 26-29 April 2005 (4-day)

Course Fee: SGD1,450 + 72.50 (GST5%)

Name of Participant: Dr/Mr/Mrs/Ms:  
(Attach your name card, if any)

Designation:

Name of Organisation:

Address:

Contact Person:

Email:

Tel No (O):

Fax No:

\*\*Dietary Preference: Chinese / Halal / Vegetarian (pls tick)

Payment mode:

Cheque / Bank draft No. : \_\_\_\_\_

VISA / MSTR : \_\_\_\_\_

Signature : \_\_\_\_\_

Expiry Date : \_\_\_\_\_

Amount (S\$) : \_\_\_\_\_

Payable to "National University of Singapore"

Closing Date : Please send in your registration form together with your payment by **19 April 2005**

Authorised Signature / Company Stamp