

KnowHow Webinars MasterClass (3-Day)

# Applied Chemical Engineering Principles for Non-Chemical Engineers

**Schedule:** Please visit [www.knowhow-webinars.com](http://www.knowhow-webinars.com)

**Program Ageda:** 10am-4pm

**Speakers:** Professor Ir. Dr. Dominic Foo & Dr. Nishanth Chemmangattuvalappil

**Registration Fee:** Member: 265 US\$; Non-Member: 375 US\$; Group (5-Pax): 725 US\$; Group (10-Pax): 1000 US\$

**Registration Form:** <https://webinars.technobiz.org/event-form-19231/>

Remarks:

- In-House/Private Sessions are available upon Request.
- Registered Participants receive Documents in PDF Format during the session.

This 3-Day Online MasterClass is designed for working professionals in the chemical industry who do not possess chemical engineering background. It provides the fundamental knowledge of chemical engineering calculations, design and operations. chemical engineering background. Topics covered include mass and energy balances, separation processes, design and operation of process equipment. Registered participants are required to participate in the TechnoBiz Knowledge Test focusing on Applied Chemical Engineering on the 3<sup>rd</sup> day to receive participation certificate.

## PROGRAM CONTENT

### 1. What is Chemical Engineering

- Key Components
- Industrial Applications
- Global Outlook

### 2. Basic Principles of Process Operation

- Open vs. Closed Systems
- Batch vs. Continuous Processes
- Steady-state vs. Transient
- General Balance Equation

### 3. Basic Mass Balances

- Balances on Single & Multiple Units
- Chemical Reaction
- Recycle & Bypass

### 4. Thermodynamics

- Reference States & State Properties
- Phase Diagram
- Steam Tables
- Specific Heat Capacity

### 5. Pump and Hydraulics

- Types of Pumps
- Bernoulli Equation
- Characteristics & System Curves
- Flow Control & Affinity Law

### 6. Heat Exchangers

- Types & Purposes
- Flow Configuration
- Design and Operating Principles

### 7. Chemical Reactors

- Selection of Reactors,
- Basic concepts,
- Selection of reactions,
- Reaction kinetics

### 8. Distillation

- Vapor-Liquid Equilibrium
- Flash column
- Distillation column

### 9. Absorption, Adsorption & Membrane

- Physical & Chemical Absorption
- Adsorption & Adsorption Cycles
- Membrane separation process

### 10. Evaporation & Crystallization

- Application of Evaporation
- Types of Evaporators
- Crystallization and Precipitation
- Supersaturation and Nucleation
- Crystal Growth and Seeding

### 11. Process Safety

- Importance of process safety
- Hazard and risk identification
- Safe operating procedures
- Qualitative risk assessment
- Inherently safer design

### 12. Scaling-up

- Concept of Similarity
- Dimensional analysis
- Selection of Variables
- Fluid Flow Scale-up

### Applied Chemical Engineering Principles (TechnoBiz Knowledge Test)

- True/False Questions
- Multiple Choice Questions

## TRAINERS

**Professor Ir. Dr. Dominic Foo** is a Professor of Process Design and Integration at the University of Nottingham Malaysia, and is the Founding Director for the Centre of Excellence for Green Technologies. He is a Fellow of the Institution of Chemical Engineers (IChemE), a Fellow of the Academy of Sciences Malaysia (ASM), a Chartered Engineer (CEng) with the Engineering Council UK, a Professional Engineer (PEng) with the Board of Engineer Malaysia (BEM), as well as the President for the Asia Pacific Confederation of Chemical Engineering (APCChE). He is a world-renowned scholar in process integration, focusing on resource conservation and CO2 reduction. He collaborates with more than 50 research scholars and industrial practitioners over Asia, Europe, North America and Africa. Professor Foo is an active author, with eight books, more than 180 journal papers and made more than 230 conference presentations, with more than 30 keynote/plenary speeches. He served as International Scientific Committees for many important international conferences (CHISA/PRES, FOCAPD, ESCAPE, PSE, SDEWES, etc.). Professor Foo is the Editor-in-Chief for Process Integration and Optimization for Sustainability (Springer Nature), Subject Editor for Process Safety & Environmental Protection (Elsevier), and editorial board members for several other renowned journals. He is the winners of the Innovator of the Year Award 2009 of IChemE, Young Engineer Award 2010 of IEM, Outstanding Young Malaysian Award 2012 of Junior Chamber International (JCI), Outstanding Asian Researcher and Engineer 2013 (Society of Chemical Engineers, Japan), Vice-Chancellor's Achievement Award 2014 (University of Nottingham) and Top Research Scientist Malaysia 2016 (ASM). He conducted close to 100 professional workshops to academics and industrial practitioners worldwide.



**Dr. Nishanth Chemmangattuvalappil** is an Associated Professor of Chemical Engineering in the department of Chemical and Environmental Engineering at University of Nottingham Malaysia. He received his PhD in Chemical Engineering from Auburn University, AL, USA (2010). He worked as a Post-doctoral fellow at University of Pittsburgh, PA, USA and later at Auburn University. His main areas of expertise include product and molecular design, mixture design and integrated biorefineries. His current work focuses on the application of molecular design concepts on reactive systems, integration of molecular design techniques into the design of biorefineries and carbon capture and storage using ionic liquids. He has co-authored more than 90 peer reviewed international journal articles and five book chapters. In addition, his works have been presented in more than 70 international conferences and in five invited lectures.



## Registration Guidelines

### Registration Fees:

Member: 265 US\$  
Non-Member: 375 US\$  
Group (5-Pax): 725 US\$  
Group (10-Pax): 1000 US\$

### Registration Form: <https://webinars.technobiz.org/event-form-19231/>

Please register online at the above link. Immediate registration confirmation note will be sent along with invoice. Participants have payment methods options of *bank transfer* or *credit card* (via Paypal) payments as per their convenience. 100% of Invoice value must be paid. Registration fee includes Training Documents, Certificate of Participation and TechnoBiz Knowledge Test Report. VAT 7% Taxes and Payment Processing Fees will apply on registration fees. Confirmed participants will receive a separate link for each module two days before schedule time.

**Participant Guidelines:** Confirmed participants, who have paid registration fees will receive a separate link for each module two days before schedule. Participants are required to have a stable & high-speed internet to access this online program. If registered participant misses any of the modules due to other commitments and prior engagements, participants can view the recorded version of module at an additional fee of 30 US\$++/Module/Person at preferred schedule. Participants who join all modules as well as knowledge test will only receive "**MasterClass Certificate**". All registered participants will receive copyrighted training document in PDF format. Registered participants are required to login 10 minutes before each module starting time on each day.

## Contact Address



**PERAM PRASADA RAO**, Director  
KnowHow Webinars, **TechnoBiz** Communications Co., Ltd.,  
2521/27, Lardprao Road, Khlongchaokhunsingha, Wangthonglang, Bangkok 10310 Thailand  
Tel: +66-89-489 0525; WhatsApp/Wechat: +66-89-489 0525; Line ID: @technobiz  
Email: [peram.technobiz@gmail.com](mailto:peram.technobiz@gmail.com) Web: [www.knowhow-webinars.com](http://www.knowhow-webinars.com)