



**SCIENTIFIC  
UPDATE**

*We've got chemistry*

# CHEMICAL ENGINEERING: WHAT SCIENTISTS AND OTHER ENGINEERS NEED TO KNOW

**3** day  
Course

2020

"The course was very interesting in providing additional information by life experience in the field. In addition, the course was well balanced in the topics presented to allow us to understand well. Thank you very much."

**Givaudan Schweiz AG**

**30**

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# CHEMICAL ENGINEERING: WHAT SCIENTISTS AND OTHER ENGINEERS NEED TO KNOW

A 3 day course

## INTRODUCTION

R&D scientists are often at a disadvantage when working in process research and development because of their lack of knowledge about the basic principles of chemical engineering, and the impact of decisions regarding process yield and selectivity on up- and downstream operations. Other branches of engineering face a similar disadvantage when considering the whole process.

This course has been developed, and is presented, by chemical engineers and chemists who specialise in facilitating knowledge transfer and understanding between different scientific and engineering disciplines working at the R&D-manufacturing interface. As a result, it does not dwell on the derivation of mathematical formulae or equations used in chemical engineering design, but instead focuses on what other disciplines need to know about the information and data that chemical engineers require for design, scale-up and process troubleshooting.

Chemical engineering without mathematics is impossible, but this course presents only relevant mathematics at a level that should not trouble anyone with a numerate scientific degree. Other disciplines do not need to know how to design plants or equipment and this course does not attempt to teach this. The course focuses on understanding chemical engineering principles to promote clear communication between disciplines, facilitating information and knowledge transfer.

## COURSE OUTLINE

### Introduction to Chemical Engineering

- > What do some chemical engineers do?
- > Dimensionless groups
- > Process representations and their uses
- > Conservation of mass and material balances
- > Conservation of energy and energy balances

### Flow of Fluids

- > Basics of fluid behaviour
- > Fluid properties
- > Flow measurement
- > Reynolds number
- > Pressure drop in pipes
- > Types of pump and pump selection
- > Applications of mixing
- > Types of agitators
- > Mixing regimes and their effects on process
- > Solid-liquid and gas-liquid mixing

### Heat Transfer

- > Fundamentals of conduction and convection, heat transfer coefficients
- > Types of heat transfer equipment
- > Heat transfer in batch vessels
- > Evaporation
- > Joule-Thomson effect
- > Humidity and drying, dryer design

### Mass Transfer and Separation Processes

- > Introduction to mass transfer
- > Phase equilibria
- > Mass transfer coefficients
- > Introduction to column contractors
- > Gas absorption
- > Distillation
- > Solvent extraction processes and equipment

### Reaction Engineering

- > Reaction engineering principles
- > Simple approaches to reactor design and selection

### Introduction to Process Safety

- > Principles of intrinsic and inherent safety
- > Electrostatics
- > Dust explosions
- > Pressure relief
- > Instrumented protection

## WHO SHOULD ATTEND?

This course would be useful to any scientists and technologists, or engineers from other branches of engineering, who are involved in process research & development, scale-up, or manufacturing.

The course will help enable better technology transfer and communication with your chemical and process engineers.

"Very helpful course to leverage engineers & chemists collaboration."

Merck & Cie

## IN-HOUSE COURSE

For 8+ people contact us to discuss holding this event In-House - [sciup@scientificupdate.com](mailto:sciup@scientificupdate.com)



# SCIENTIFIC UPDATE

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Registration 9.00  
Course commences 9.15 Day 1  
Course adjourns 5.00 on Day 3  
Course fees include a comprehensive course manual, refreshments throughout each day, lunches and one course dinner on the first evening

For all prices and dates please refer to our website



IT'S EASY TO REGISTER ONLINE

## COURSE TUTORS



**Mark Talford**  
CEng MChemE

Mark Talford graduated from the University of Bradford, initially with a BEng in Chemical Engineering in 1998 and subsequently with a PhD in polymer process modelling in 2002. In 2001 Mark was appointed to a lectureship in Chemical Engineering at Bradford, teaching a range of subjects at all levels of the degree course whilst completing his doctoral research.

In 2012 Mark was appointed as Britest's Technical Director, leading an innovation activity to develop and apply the Britest approach into new areas. Mark also works with companies to support the deployment of the Britest tools, either through leading process studies using the Britest methodology or training staff to apply Britest approaches themselves - Mark was involved in training both Charlie and Rob in the Britest tools!

*You can find the full tutor biographies on our website, tutors will depend on location.*



**Robert Peeling**  
CEng FIChemE, MIET

Rob Peeling obtained a BSc in Chemical Engineering from UMIST in 1983. This included two industrial placements in the chemical laboratories at Monsanto and at Shell Carrington. He spent a year at the Shirley Institute in Manchester developing approaches for conserving energy in the textile dyeing and finishing sector. Moving to Tioxide in the north-east of England, Rob developed high power thermal plasma heaters for titanium pigment manufacture followed by periods in process development and design before moving to plant operations. In parallel, Rob developed skill and experience in process safety and as a hazard study leader.



## COURSE OBJECTIVES

Chemists, biologists and engineers regularly interact and collaborate in process R&D projects. For effective team working they should each understand the needs and objectives of the other disciplines.

This course gives scientists and other engineering disciplines an introduction to the main aspects of chemical engineering science that will help them realise the importance of the subject. It introduces and describes core principles of chemical engineering and how process technologists can provide data and information to support the chemical engineers in their work. The course will help other process technologists

appreciate the role of chemical engineers and assist in understanding their requirements.

The course will equip process technologists with a sufficient understanding of chemical engineering to foster better communication with chemical and process engineers. It will enable delegates to be aware of the impact of chemical engineering principles on successful scale-up and process problem solving. The principle aim is that delegates will be able to discuss chemical engineering issues affecting their processes and relate them to their own areas of expertise.

## REGISTRATION

Use our **fast online booking system by visiting**

**[www.scientificupdate.com](http://www.scientificupdate.com)**

Alternatively you can mail or fax the attached registration form to:  
Scientific Update  
Maycroft Place, Stone Cross,  
Mayfield, East Sussex, TN20 6EW, UK  
Fax Number +44 1435 872734

### How to Pay

When you register online, you can have the option to pay via credit card (Amex, MasterCard or Visa). A receipted invoice will be automatically generated once paid and sent via email. Should your company wish to pay by cheque or bank transfer, on booking, bank details will be supplied with an invoice.

### Group Discounts

Group discounts are available on two or more attendees - see registration form. This offer only applies if bookings are made simultaneously and from the same billing address.

### Confirmation of your registration

These will be sent via email.

### Late Applications

For late applications, please register online or fax the completed registration form, including credit card payment information.

### Cancellations/Refunds

Should you be unable to attend and cancel in writing no later than 1 month before the start of the course, Scientific Update will refund your registration less £300.00 (or equivalent in €/€) processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.

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**Discounts**

Complete the details for either two or three delegates and your discount will automatically be applied. This offer only applies where all delegates are booked simultaneously and at the same billing address.

**Cancellations**

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