



# SCIENTIFIC UPDATE

*We've got chemistry*



## DESIGN OF EXPERIMENTS FOR CHEMISTS AND ENGINEERS (DOE) 30 SEPT - 1 OCT 2019

**Basel,  
Switzerland**  
Radisson Blu  
Basel

A 2 day course  
presented by  
**Dr Paul Murray**

"Excellent course  
material and examples.  
A must for PR&D and  
Production chemists."

**Carbogen AMCIS**

# DESIGN OF EXPERIMENTS FOR CHEMISTS AND ENGINEERS (DOE)

Multiple attendees discounts  
**UP TO 15% available**

**30 Sept - 1 Oct 2019** Basel, Switzerland, Radisson Blu Basel

## INTRODUCTION

**Industrial Scientists can no longer afford to experiment in a trial-and-error manner, changing one factor at a time. A far more effective method is to apply a systematic approach to experimentation that considers all factors simultaneously.**

This approach is called Design of Experiments (DoE) and many scientists use it as an efficient way to solve serious problems afflicting their projects.

DoE provides information about the interaction of factors and the way the total system works, something not obtainable through traditional testing methods. DoE also shows how interconnected factors respond over a wide range of values, without requiring the testing of all possible values directly. DoE is a fundamental aspect of Quality by Design

The two day course is written and presented by a process chemist with extensive experience of applying DoE across a wide range of chemical reactions from reaction screening and new route development through to reaction optimisation and scale up.

The course will empower scientists to implement DoE in their work to more efficiently improve their processes.

## COURSE OUTLINE

### DAY ONE

#### Session 1

Introduction to the principles of design of experiments with a comparison to traditional methods.

#### Session 2

Designs for 2 factors. Taylor's expansion and an introduction to the maths. Designs for 3 and more factors.

#### Session 3

Workshop: Identifying factors, selecting ranges. Identifying main effects and interactions.

#### Session 4

Fractional Factorial designs. Different design types from screening designs to optimisation and robustness designs. How and when to use the different design types.

### DAY TWO

#### Session 1

Principal component analysis (PCA) for solvent selection.

#### Session 2

Case studies.

#### Session 3

Workshop: implementing DoE.

#### Session 4

Review of the course and questions.

## COURSE OBJECTIVES

### What does the course set out to achieve?

Design of Experiments (DoE) is a statistical tool which enables the efficient exploration of potential reaction parameters and their effect on a process. DoE is a fundamental aspect of Quality by Design.

The course will introduce the DoE Process and how to use it to develop and understand chemical reactions and processes.

## VENUE

**Radisson Blu Basel**  
Steinentorstrasse 25  
CH-4001 Basel  
Switzerland

+41 (0)61 227 2727

[www.radissonblu.com/en/hotel-basel](http://www.radissonblu.com/en/hotel-basel)

This four star hotel lies 1 kilometer from the banks of the Rhine River and also just a 5-minute walk from

the main train station, where you can board a free shuttle to EuroAirport Basel-Mulhouse-Freiburg.

Other hotel amenities include free Wi-Fi, a fitness center, sauna and indoor pool with massage jets.

There is a special accommodation rate of 229 CHF details on how to book this rate will be given on the course joining instructions.





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**Start** 9.00am - Monday 30 September

**Finish** 3.30pm - Tuesday 1 October

**Course dinner** 6.30pm - Monday 30 September

**Course Fee:** €1,899

Which includes comprehensive course manual, refreshments throughout the day, lunch and one course dinner.

**Course fee: €1,899**

## COURSE TUTOR

### Dr Paul Murray

Paul Murray Catalysis Consulting Ltd

Paul is a consultant with expertise in the fields of Catalysis, Design of Experiments, Principal Component Analysis and Process Development. Paul has a proven track record of the timely delivery of innovative solutions to projects resulting in significant reductions in costs and resources to customers.



Paul worked as a Process Development Chemist at AstraZeneca and collaborated with academics at the University of Bristol to develop ligand property maps to enable the use of DoE for the efficient, rational development of catalytic reactions. Paul has 21 publications and 9 patents to date.

## REGISTRATION

You can either use our fast online booking system or 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 (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 bank details will be supplied with an invoice.

### Bank Transfer or Cheque

Should your company wish to pay by cheque or bank transfer, on booking you can choose between paying in either €, \$ or £. All 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 (or equivalent in €/€) processing fee. Unfortunately refunds are not possible after that date. Substitutions can be made at any time.

## IN-HOUSE COURSE

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

### What will attendees gain from the course?

- > Understand the DoE process.
- > Select process factors and suitable ranges.
- > Understand the different types of experimental design and when to use them.
- > Identify main effects, interactions and interpret DoE models in relation to chemical understanding.
- > Understand where DoE will solve a problem and when to consider complementary techniques like reaction progress kinetics to probe more challenging processes.

## CONSULTANCY SOLUTIONS

### OUR EXPERTISE

We are specialists in Industrial Organic Chemistry, solving problems and managing projects in Process Research and Development covering the following industries:

- > Pharmaceuticals
- > Fine Chemicals
- > Agrochemicals
- > Flavour & Fragrance
- > Specialty Chemicals

### OUR TEAM

You will be assigned one leading consultant but you will benefit from our team with over 100 years collective industrial experience.

### OUR APPROACH

We will sign a CDA and discuss your project by telecon or webinar to assess what benefits we can offer. This initial consultation (up to 4 hours) is free of charge. After which we will offer a detailed proposal with the service we can provide tailored to your individual requirements.

# DESIGN OF EXPERIMENTS FOR CHEMISTS AND ENGINEERS (DOE)



## FAST ONLINE REGISTRATION

Look for the **BOOK NOW** button on the event of your choice  
[www.scientificupdate.com](http://www.scientificupdate.com)

30 Sept - 1 Oct 2019 Basel, Switzerland

No. of attendees  @ €1,899

**Special Offer!** Register 2 delegates and receive 5% on 2nd booking  
Register 3 delegates and receive 10% on 3rd booking  
Register 4 or more delegates and receive a 15% discount

### First attendee

Company   
Title (Dr/Prof/Mr/Mrs/Ms)   
First name   
Surname   
Job Title   
Address   
  
  
Post Code / Zip   
Country   
Tel   
Fax   
Email   
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Special Diet   
I would like to subscribe to your FREE bi-monthly newsletter  
What's new in Process Chemistry?

### Second attendee **SAVE 5%**

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### Third attendee **SAVE 10%**

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We accept the following credit cards:  
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To pay by credit card a secure link will be provided once you receive your booking confirmation email, this will then take you to a secure payment gateway.  
\*payments via Amex can only be made in US dollars

**\* Currency Payments**  
If you select to pay in GBP, or Dollars the amount charged will be based on the exchange rate at the time of preparing the invoice.

**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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**Data Protection**  
Scientific Update Ltd is registered under the Data Protection Act 1998. We will store your information securely and only share your contact details with other attendees at this event. If you are happy for your details to be passed to any third parties please tick here:

For full terms of business and payment details please see our website

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