



SCIENTIFIC
UPDATE

We've got chemistry

DESIGN OF EXPERIEMENTS FOR CHEMISTS AND ENGINEERS (DOE)

2^{day}
Course

2020

"The course is well done! There are a lot of useful references from literature and the problem sessions help to develop troubleshooting and new ways of thinking."

INDENA SpA

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the global chemistry industry

1989 - 2019

DESIGN OF EXPERIMENTS FOR CHEMISTS AND ENGINEERS (DOE)

A 2 day course

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.

WHO SHOULD ATTEND

- > Lab scientists
- > Process development scientists
- > Lab managers
- > Researchers
- > Project managers

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.

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.

DAY TWO

Session 1

Principal component analysis (PCA) for solvent selection. Combining PCA and DoE

Session 2

Case studies.

Session 3

Workshop: implementing DoE and developing designs for your process

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.

- > Apply DoE to develop safe and robust processes
- > Link DoE with process development and QbD
- > Comprehensive manual with examples and case studies
- > Provide a step-by-step process for successful DoE



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Registration 8.30

Course commences 9.00 Day 1

Course adjourns 5.00 on Day 2

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

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.



Dr Paul Murray

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

Carbogen AMCIS

IN-HOUSE COURSE

For 8+ people contact us to discuss holding this event In-House - sciup@scientificupdate.com

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- > Fine Chemicals
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- > 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 telecom 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

REGISTRATION

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

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Alternatively you can mail or fax the attached registration form to:
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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.

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

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