

# Design of Experiments

## 3½ Day Programme

Smallpeice Enterprises

business improvement training



### Open enrolment classes

#### April 2024 course:

- Day 1: **Apr 23** 8.30am – 12.30pm BST
- Day 2: **Apr 29** 8.30am – 4.30pm BST
- Day 3: **Apr 30** 8.30am – 4.30pm BST
- Day 4: **May 1** 8.30am – 4.30pm BST

#### August 2024 course:

- Day 1: **Aug 13** 8.30am – 12.30pm BST
- Day 2: **Aug 21** 8.30am – 4.30pm BST
- Day 3: **Aug 22** 8.30am – 4.30pm BST
- Day 4: **Aug 23** 8.30am – 4.30pm BST

#### November 2024 course:

- Day 1: **Nov 8** 8.30am – 12.30pm GMT
- Day 2: **Nov 18** 8.30am – 4.30pm GMT
- Day 3: **Nov 19** 8.30am – 4.30pm GMT
- Day 4: **Nov 22** 8.30am – 4.30pm GMT

### Fees:

The cost per participant is £850+VAT, which includes comprehensive reference materials.

### To book places:

- Please email Smallpeice via [train@smallpeice.com](mailto:train@smallpeice.com) with your requirements.
- Our experienced booking team will then send you a booking form.

### In-Company Training:

This programme is available for cost effective 'in-company' group training. This provides the opportunity to customise the content and to include practical activities that are linked to your own processes and products. For more information on the options, please email [train@smallpeice.com](mailto:train@smallpeice.com).

### Overview

Design of Experiments (DoE) is a powerful and practical way to analyse multifactor process/product variances. This course provides practical, hands-on training in the application of Design of Experiments (DoE), exploring the essential elements that range from upfront requirements needed to launch an experiment (planning, resource support, stakeholder approvals) all the way through to running the experiment and analysing results. The training explores different types of DoE which are suitable for a wide variety of applications and market sector uses for both product development to process optimisation.

### Objectives

- To provide a structured approach for efficient planning and execution of a Design of Experiment.
- To enable assessments and alternative options when an experiment becomes 'data hungry' and uneconomic to perform.
- To provide a step-by-step analysis of each type of experiment using Minitab Statistical Analysis software.
- To demonstrate the different ways in which the results of the Design of Experiments can be used.

### Training Format

Training will be delivered live via MS Teams, incorporating a mix of theory and interactive activities / discussions.

DAY 1 (4 hours)	DAY 2 (8 hours)	DAY 3 (8 hours)	DAY 4 (8 hours)
<b>INTRODUCTION TO DOE</b> <ul style="list-style-type: none"> <li>• Overview of DOE techniques</li> <li>• Optimisation challenge</li> <li>• Applications of DOE techniques</li> </ul>	<b>OPTIMISING THE PROCESS</b> <ul style="list-style-type: none"> <li>• Regression analysis</li> <li>• Understanding correlation</li> <li>• Introduction to simple linear regression</li> <li>• Introduction to multiple regression</li> </ul>	<b>SCREENING &amp; TAGUCHI METHODS</b> <ul style="list-style-type: none"> <li>• Introduction to fractional factorial</li> <li>• Screening designs</li> <li>• The use of EVOP to optimise a non-linear response</li> <li>• Taguchi loss function</li> <li>• Taguchi designs that deliver robust solutions in the presence of noise</li> </ul>	<b>ADVANCED DOE TECHNIQUES</b> <ul style="list-style-type: none"> <li>• Mixed and multi-level designs</li> <li>• Response surface designs</li> <li>• Botched runs</li> <li>• Randomisation and grey coding</li> <li>• How to customise a DOE with historical data</li> </ul>