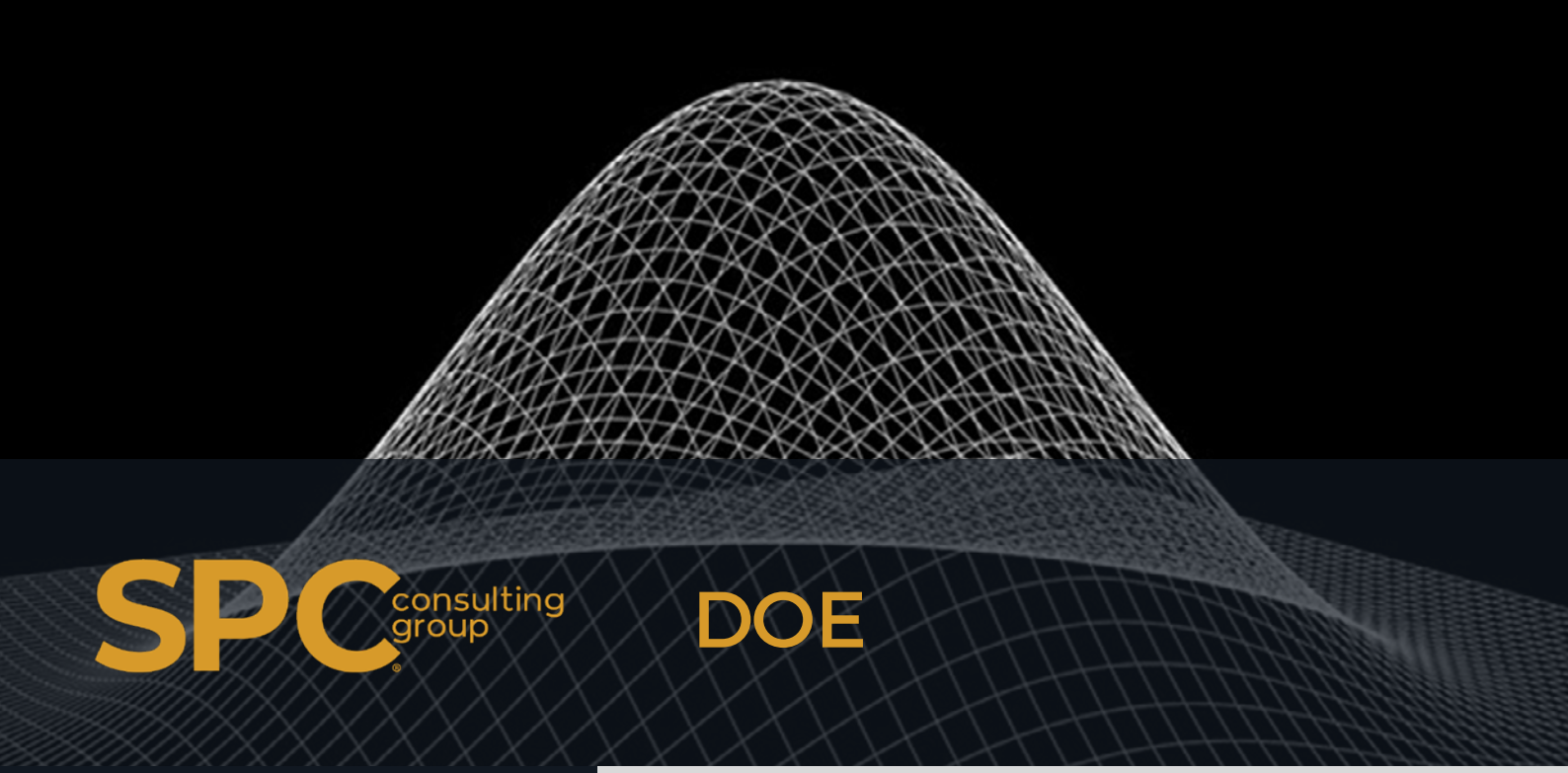

SPC consulting group

DOE

Objective:

The participant will understand the theory for a factorial design to study the relationship between multiple input variables, or factors, on key output variables, or responses
The participants will use the software Minitab statistic for optimize the process output.

Prerequisites:

- Knowledge of the product process and/or manufacturing processes
- A computer with Minitab

Duration:

16 hours

Introduction

- Basic concepts
- Importance of experiments
- How do we plan an experiment?
- Descriptive statistics
- Hypothesis testing
- Analysis of variance of 1 and 2 factors
- Linear regression
- Types of Experimental Designs

Full Factorial Design

- Selection of factors and response variable
- Full factorial model
- 2-factors factorial design
- Balanced matrix
- Randomness
- Interactions
- Replication and repetitions
- Main effects and interactions
- Factors coding
- 3-factors factorial design

Minitab for Design of Experiments

- Creation of a factorial design
- Analysis of a factorial design
- Transfer function
- Factorial plots
  + Main effects plot
  + Interaction plot
  + Cube plot
- Response Optimizer

Fractional Factorial Design

- Fractional factors
- Selection of factors
- Aliasing
- Resolution

Results analysis

- From the mathematical model to the real world
- Decision making