

# CHALMERS

A Chalmers Tracks course on

## Statistical Engineering Practices for Industrial Development – SEPID22

A key for understanding variation in product and process development

### Introduction

The industry today puts a lot of effort into the development of robustness and sustainability of product and processes without raising cost. This is a multi-disciplinary and cross functional challenge that requires **professional skills**; how to understand, quantify and communicate the influence of variation on product and/or process performance in the complex organizational engineering context.

The purpose with this course is to develop professional skills of how to get the most out of the data: how to explore historical data and how to plan new data collection in both from experiments and simulations (meta-modelling).

Several general concepts and procedures that bridge basic statistics with applied industrial development of products and processes are addressed that are part of the standard toolbox for Six Sigma professionals.

This is a project course on half speed (that is 7,5 hec over two study periods) **and is designed to be a robust companion supporting both thesis projects (bachelors or masters) in parallel or any 3-4 months long projects in industry (or healthcare).**

After the course, the engineers are equipped with a larger professional toolbox and are better prepared to approach typical development challenges such as:

- Large historical data-sets
- Wrong data for the right problem
- Low data quality – that hide signals in noise
- Low process capability
- Limited experimental budgets
- Conflicting objectives and correlated parameters
- Sensitivity analysis on larger simulation models

In order to develop skills to navigate and handle such challenges this course addresses the following themes through workshops and practical applications:

- Statistical thinking in problem definition and solving
- Exploratory data analysis, graphical analysis of data
- Quality methods
- Fact-based Decision making
- Correlation and Regression
- Modern methods for Design of experiments
- Predictive and prescriptive modelling and optimization
- Text mining!

### Teaching platform

- Selected theory from books and journals and statistical platform JMP Pro ([www.jmp.com](http://www.jmp.com))

### Requirements

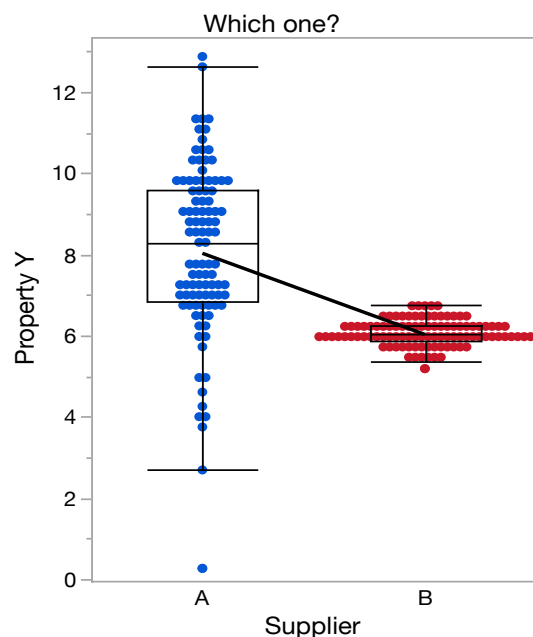
- Any student and Chalmers alumni that passed basic courses in mathematical statistics on bachelor level can apply.

### How to apply

- Please send motivation letter (<400 words) of your interest in and practical experience (or need) of statistical engineering and transcript of your Chalmers courses to Peter Hammersberg ([peter.hammersberg@chalmers.se](mailto:peter.hammersberg@chalmers.se)).
- Student will be admitted based on the selection criteria mentioned above (max. 30 students).

### Details

- Course number: TRA105 / TRA100
- Number of credits: 7,5
- Application deadline: Dec 1<sup>st</sup>, 2021
- Study period 3 and 4: Jan-June 2022
- Grading: Continuous examination (quiz-based), hand-ins and projects (5, 4, 3, F)
- Examiner: Peter Hammersberg, Ph.D, Senior Lecturer, Six Sigma Master Black Belt.



**Welcome!**