



## Design of Experiment Statistisk försöksplanering

7.5 credits

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**Ladok Code:** 41T09B

**Version:** 3.0

**Established by:** Board of the department 2010-11-22

**Valid from:** Autumn 2010

**Education Cycle:** First cycle

**Main Field of Study (Progressive Specialisation):** Production and Quality Control Technology (G1F)

**Disciplinary Domain:** Technology

**Prerequisites:** Knowledge corresponding to Regression Analysis 7.5 Credits or Mathematical Statistics 7.5 Credits.

**Subject Area:** Industrial Engineering and Management

**Grading Scale:** ECTS-credits

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### Content

The course contents are:

- factorial and fractional factorial designs
- blocking
- visualisation and diagnostic tools
- quality tools for uncovering significant factors
- factorial designs with analysis of variance (ANOVA)
- statistical tests
- factorial designs with centre-points
- hypothesis testing
- transformation of response data
- variance of effects
- verification of factorial experiments
- the missing data problem
- explanatory models

### Learning Outcomes

The student shall upon completion of the course be able to

- design, conduct and analyse factorial and fractional factorial experiments first and foremost in an industrial manufacturing setting
- employ the results (the models) yielded from designed experiments for the purpose of improving the manufacturing processes
- determine when designed experiments apply in industrial and societal contexts
- judge when and how external variation may interfere with the results of an experiment
- employ quality tools for visualisation of significant factors
- employ statistical tests commonly used in industrial manufacturing
- analyse experimental results using statistical software
- validate a statistical model
- analyse and conduct a factorial experiment with centre-points

### Forms of Teaching

The instruction consists of the following activities:

- lectures
- exercises

- experiments
- software-based classes
- seminars
- project work
- field studies
- group presentations

The language of instruction is English.

### **Forms of Examination**

The course will be examined through the following examination elements:

*Written exam*

Learning outcomes:

Credits: 5.5

Gradingscale: ECTS-credits

Learning outcomes:

Credits: 2

Gradingscale: Fail (U) or Pass (G)

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

### **Literature and Other Teaching Materials**

### **Student Influence and Evaluation**

### **Miscellaneous**