Design of experiments (c) - Spring semester (ENG-606(c))

Manufacturing Systems and Robotics

Remarque / Remark	**Spring semester (block course)** (Manufacturing Systems and Robotics, 2012-2013)		
Instructor	Fuerbringer Jean-Marie	**Frequency**	Every year

Program(s)/Acad.year	Total hours	Examination procedure	ECTS credits
Manufacturing Systems and Robotics (2012-2013)	Lecture: 20 H Practical work: 36 H	Project report	4
Civil and Environmental Engineering (2012-2013)	Lecture: 20 H Practical work: 36 H	Project report	4

Learning outcomes:

The course teaches the acquisition of a methodology of designing experiments for optimal quality of the results and of the number of experiments. Specifically the objectives are:

- To transfer to the student the conceptual basis for designing, performing and analyzing statistical design of experiments
- To let the student understand the methodology of response surface, with the mathematical concepts that allow the evaluation and the optimization of a matrix of experiments
- To develop a principle of know-how to evaluate, optimize and analyze design of experiments
- To develop conceptual understanding of the design of experiments that allows the PhD student to collaborate with statisticians

Content:

- Empirical modeling
- Model with constant coefficient
- Model with random coefficients
- Parametric Model
- Analysis of variance (Anova)
- Graeco-latin squares designs
- Matricial treatment of the multilinear regression
- Factorial designs
- Fractional Factorial design
- Hybrid designs
- Equiradial designs

Keywords:

experimental methodology, optimization of experimental plan, applied statistics, empirical models, sensitivity analysis

Required prior knowledge:

Basic statistics, Matrix algebra, Matlab and/or Excel

Note:

Given during spring semester; block course (2x3 days)