

9 April 2010

PV53

Response Surface Methodology (7,5 credits)

Optimering baserad på responsytor (7,5 hp)

Response surface methodology (RSM) has developed into a very efficient method for optimization of products and processes. The methodology was originally proposed by Box and Wilson 1951, and it was initially mainly used in quality engineering to improve industrial processes. Also work done by Taguchi is closely related to RSM. With the introduction of computational methods as a major tool in product development, the RSM has also been used as a very important tool for optimization in the design process. In the context of optimization of virtual products and processes, RSM is closely related to what has been termed Meta-model Based Optimization, and can easily be integrated into a Simulation Based Design process.

Organization

The course will be given at the Division of Solid Mechanics, Linköping University. The first meeting will be held April 15, at 10.15 to 15.00. The subsequent dates for the course will be decided at this first meeting in order to fit into the agenda of most attendees. Efforts will be made to arrange the meetings in two days clusters. In total 7-8 full days of meetings are planned. The lectures will be given in English or Swedish upon request.

Content

- Building empirical models
- Two-level factorial designs
- Two-level fractional factorial designs
- Process improvements with steepest ascent
- The analysis of second-order response surfaces
- Experimental design for fitting response surfaces
- Advanced response surface topics
- Robust parameter design and process robustness studies
- Experiments with mixtures
- Other mixture design and analysis techniques
- Continuous process improvement with evolutionary operation

Course book

Meyers, R.H., Montgomery, D.C., Anderson-Cook, C.M.: Response Surface Methodology, Third Edition, Wiley, 2009

Examination

Project work with reports.

Eligibility

Knowledge in mathematics, mathematic statistics, and optimization methods corresponding to what is taught in a Mechanical Engineering curriculum on an MSc level or similar.

Teacher

Professor Larsgunnar Nilsson, larsgunnar.nilsson@liu.se, 070-523 35 39

Course administration and registration

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