



KTH ENGINEERING MECHANICS

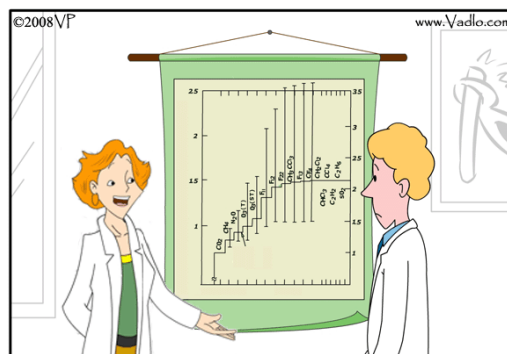


DIP. DI INGEGNERIA INDUSTRIALE

## Uncertainty analysis for engineers

Lecturers: Prof. Henrik Alfredsson (Royal Institute of Technology, Stockholm)

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(picture from: <http://paul-baxter.blogspot.it/2010/06/error-bars-are-necessary-part-of.html>)

### PROGRAM

February 13-15 (10 hours)

#### Lecture 1: Monday, February 13<sup>th</sup> (3h) 3 pm -6 pm

1. Introduction: Why uncertainty analysis?
2. Errors and uncertainties in a measured variable
3. Basic probability theory I

#### Lecture 2: Tuesday, February 14<sup>th</sup> (3h) 3 pm -6 pm

4. Basic probability theory II
5. What to do with outliers?
6. Uncertainty in a result determined from multiple variables
  - a) Taylor-series method with examples
  - b) Monte-Carlo method with examples

#### Lecture 3: Wednesday, February 15<sup>th</sup> (4h) 9 am -1 pm

7. Sampling times and uncertainty
8. Correlated error sources
9. Planning of experiments
10. Data Analysis and Regression

Text book: Hugh W. Coleman and W. Glenn Steele, "Experimentation, Validation, and Uncertainty analysis for engineers", third edition, John Wiley & Sons, inc.