

Inverse analysis in material characterization

Monday, 29. August 2016.

9.00 – 12.30 Classroom 1A

- *Introduction to inverse problems
- *Different types of inverse problems. Setting up an inverse operator
- *Parameter identification problems through inverse analysis
- *Sensitivity analysis. Different types of ill-posedness. Optimization of experimental setup.

Tuesday, 30. August 2016.

9.00 – 12.30 Classroom PC Est – PC Ovest

- *Numerical optimization algorithms for deterministic inverse problems. Least squares problems
- *Gradient based methods. Line search methods.
- *Family of Trust Region methods.
- *Strongly non-convex objective functions. Minimization through soft computing techniques.

Wednesday, 31. August 2016.

9.00 – 12.30 Classroom 1A

- *Setting an automatic procedure for parameter characterization centered on minimization of the objective function.
- *Practical MATLAB implementation of selected optimization algorithms.
- *Interfacing ABAQUS with MATLAB for fully automatic inverse analysis procedures.

Thursday, 1. September 2016.

9.00 – 12.30 Classroom PC Est – PC Ovest

- *Inverse analysis in structural mechanics: practical exercises of material parameter assessments through inverse analysis: different case studies.
- *Assessment of different types of measuring errors: a deterministic approach.
- *Introduction to stochastic inverse analysis: Monte Carlo methods.
- *Kalman filets for stochastic inverse analysis.

Friday, 2. September 2016.

9.00 – 12.30 Classroom 1A

- *Modern trends in inverse analysis: reduced basis models and neural networks.
- * Proper Orthogonal Decomposition and Radial Basis function interpolation for fast simulation of non-linear systems.
- * Uniform space filling techniques. Latin hypercube. Dynamic interaction node method.
- * POD - RBF method for real time simulations within inverse analysis.