

CSZ Block Course

UQ & Data Analysis in Applied Sciences

April 27- May 8, 2020 (online via Zoom)
visit <http://www.zhcs.ch/> for more information



Event Schedule

(tentative)

Chair of Risk, Safety and Uncertainty
Quantification, ETH Zurich

(18 hours)

- UQ1. Introduction to uncertainty quantification
- UQ2. Modelling sources of uncertainty
- UQ3. Uncertainty propagation by Monte Carlo simulation
- UQ4. Polynomial chaos expansions (1)
- UQ5. Polynomial chaos expansions (2)
- UQ6. Sensitivity analysis
- UQ7. Structural reliability and rare events simulation (1)
- UQ8. Structural reliability and rare events simulation (2)
- UQ9. Tutorial: UQLab

CSZ Block Course Series

Event Schedule

(tentative)

Chair of Computational Science, ETH Zurich AND System Dynamics Laboratory, University of Thessaly, Greece

(18 hours)

- CS1. Introduction to Bayesian Inference
- CS2. Stochastic Optimization
- CS3. Model Selection and Uncertainty Propagation
- CS4. Tutorial I: KORALI software for Bayesian UQ
- CS5. Hierarchical Bayesian Inference
- CS6. Advanced Markov Chain Monte Carlo
- CS7. Machine Learning for Model Reduction
- CS8. Tutorial II: KORALI software for Bayesian UQ
- CS9. Optimal Experimental Design

CSZ Block Course Series

Event Schedule

(tentative)

Chair of Structural Mechanics, ETH Zurich
(18 hours)

- SM1. Overview – Mathematical background
- SM2. Time series analysis I – Basic concepts and parametric modelling
- SM3. Time series analysis II – Output-only subspace identification
- SM4. MATLAB Tutorial I (system identification)
- SM5. Linear State estimation – Luenberger observer/Kalman filter
- SM6. MATLAB Tutorial II (Bayesian Estimators)
- SM7. Nonlinear State estimation – The Unscented and Particle Filters
- SM8. SIMULINK Tutorial I (Nonlinear & Non-stationary systems)
- SM9. Advanced topics – Surrogates for Nonlinear & Time Varying Systems

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