

Lecturers: Peter Reichert (PR), Carlo Albert (CA), Andreas Scheidegger (AS), Simone, Ulzega (SU) [all Eawag], Dmitri Kavetski (DK) [University of Adelaide, Australia].

Practice sessions and support in R: Dario Del Giudice (DDG) and David Machac (DM) [Eawag].

Lectures and practice sessions will take place in FC-C20, lunch in the restaurant downstairs.

Sunday, May 31: Optional Preparatory Course

10:15 - 11:00	lecture	AS	Review of probability theory and statistics
11:15 - 12:00	lecture	DK	Review of optimization techniques
13:00 - 14:00	lecture	DM	Review of the R programming language
14:30 - 16:00	practice	DM	Practice in R

Monday, June 1: Probabilistic Models

08:45 - 09:15	lecture	DK	Introduction to the Course
09:30 - 10:15	lecture	PR	Representation of models, likelihood function
10:45 - 11:30	lecture	SU	Sensitivity and identifiability analysis
11:45 - 12:30	lecture	CA	Monte Carlo simulation
14:00 - 17:00	practice	all	Practice of sensitivity analysis, identifiability analysis and simulation of model results
17:00 - 17:30	discussion	DM	Discussion of exercises

Tuesday, June 2: Introduction to Bayesian Analysis

08:30 - 09:15	lecture	PR	Concepts of Bayesian analysis
09:30 - 10:15	lecture	DK	Simple Bayesian schemes, identifiability
10:45 - 11:30	lecture	CA	Bayesian computation with Monte Carlo methods
11:45 - 12:30	lecture	DK	Posterior diagnostics
13:45 - 14:00	<i>course picture</i>		<i>Outside or in the atrium, depending on the weather</i>
14:00 - 17:00	practice	all	Practice of Bayesian inference and diagnostics
17:00 - 17:30	discussion	DK	Discussion of exercises
18:00 - 21:00	<i>barbecue</i>	<i>all</i>	<i>At the small river close to Eawag; only if the weather is nice</i>

Wednesday, June 3: Bayesian Computation and Alternative Techniques

08:30 - 09:15	lecture	DK	Hierarchical models (including Gibbs sampling)
09:30 - 10:15	lecture	CA	Kalman and particle filters
10:45 - 11:30	lecture	AS	Practical aspects of Bayesian computation
11:45 - 12:30	lecture	DK	Alternative methods of model calibration
14:00 - 17:00	practice	all	Practice of Bayesian inference / advanced methods
17:00 - 17:30	discussion	DDG	Discussion of exercises
17:30 - 18:30	<i>guided tour</i>	<i>KL</i>	<i>Guided tour through the building and to the river</i>

Thursday, June 4: Advanced Topics

08:30 - 09:15	lecture	PR	Model structure uncertainty, consideration of model bias
09:30 - 10:15	lecture	CA	Approximate Bayes computation, emulators
10:45 - 11:30	lecture	DK	Hydrological modeling, uncertainty and hypothesis testing
11:45 - 12:30	lecture	SU	Bayesian inference and physics
14:00 - 17:00	practice	all	Practice of Bayesian inference / own problems
17:00 - 17:30	discussion	CA	Discussion of exercises

Friday, June 5: Discussion of Problems of the Participants

08:30 - 09:15	discussion	all	Discussion of problems of the participants
09:30 - 10:15	discussion	all	Discussion of problems of the participants
10:45 - 11:30	discussion	all	Discussion of problems of the participants
11:45 - 12:30	discussion	all	Feedback to the course
14:00 - 17:00	practice	all	Practice and discussion of topics suggested by participants