

Eawag Summer School in Environmental Systems Analysis 2012

PR/12.05.2012

Lecturers: Peter Reichert (PR), Carlo Albert (CA), Dmitri Kavetski (DK)

Practice sessions and short course in R: Dario del Giudice (DG), David Machac (DM) and Colombe Siegenthaler-Le Drian (CS)

Course Program (lectures and practice sessions: FC-C20; Introductions to R and to probabilities: FC-C 24)

Monday, June 4

08:30 - 09:00		PR	Introduction to the course
09:00 - 09:30	lecture	PR	Importance of models Causes and description of uncertainty Mathematical representation of models
09:30 - 10:00	break		
10:00 - 11:00	lecture	PR	Construction of models, sensitivity analysis Frequentist inference: Tests, confidence regions
11:00 - 11:30	break		
11:30 - 12:30	lecture	CA	Frequentist inference: Identifiability, model structure selection
12:30 - 14:00	lunch		
14:00 - 17:30	practice	all	Practice of sensitivity analysis and frequentist inference
14:00 - 16:00	short course	DM	Introduction to R (optional; parallel to practice session)
16:30 - 17:30	short course	PR	Introduction to probabilities (optional; par. to practice)

Tuesday, June 5

08:30 - 09:30	lecture	PR	Bayesian inference: Priors, updating, prediction
09:30 - 10:00	break		
10:00 - 11:00	lecture	CA	Bayesian numerics: Monte Carlo methods I (Importance sampling, Markov chains, Filters)
11:00 - 11:30	break		
11:30 - 12:30	lecture	DK	Bayesian inference: Hierarchical models, posterior diagnostics, identifiability, numerics
12:30 - 14:00	lunch		
14:00 - 17:30	practice	all	Practice of Bayesian inference / simple techniques

Wednesday, June 6

08:30 - 09:30	lecture	PR	Bayesian inference: Model bias
09:30 - 10:00	break		
10:00 - 11:00	lecture	CA	Bayesian numerics: Monte Carlo methods II: (Adaptive sampling, Approximate Bayes Comput.)
11:00 - 11:30	break		
11:30 - 12:30	lecture	DK	Computational issues: Local and global optimization, numerical model design and implementation
12:30 - 14:00	lunch		
14:00 - 17:30	practice	all	Practice of Bayesian inference / advanced methods

Thursday, June 7

08:30 - 09:30	lecture	DK	Input and structural uncertainty
09:30 - 10:00	break		
10:00 - 11:00	lecture	CA	Stochastic modeling and experimental design
11:00 - 11:30	break		
11:30 - 12:30	lecture	PR	Bayesian numerics: emulation
12:30 - 14:00	lunch		
14:00 - 17:30	practice	all	Practice of Bayesian inference / own problems

Friday, June 8

08:30 - 09:30	discussion	all	Discussion of problems of the participants
09:30 - 10:00	break		
10:00 - 11:00	discussion	all	Discussion of problems of the participants
11:00 - 11:30	break		
11:30 - 12:30	discussion	all	Feedback of participants to the course
12:30 - 14:00	lunch		
14:00 - 16:30	practice	all	Practice on subject chosen by the participants