16th Eawag Summer School in Bayesian Methods for Environmental Modelling (preliminary)

<div align="right">9.01.2025</div>

Lecturers: Carlo Albert (CA), Andreas Scheidegger (AS), Dmitri Kavetski (DK), Marco Baity Jesi (MBJ), Marvin Höge (MH) and Peter Reichert (PR).

Practice sessions: Thiago Nascimento (TN), Alberto Bassi (AB), Cheng Chen (CC).

Sunday, June 15: Optional Preparatory Course

14:00 - 15:00	lecture	AS	**Review of probability theory**
15:15 - 15:30		AS	**Introduction to exercises**
15:30 - 17:00	practice	CC	Exercises

Monday, June 16 : Probabilistic Models

08:45 - 09:00		CA	**Introduction to the Course**
09:00 - 09:45	lecture	CA	**Probabilistic modelling**
09:45 - 10:15		CA, all	Introduction and expectations of participants
10:45 - 11:15	lecture	AS	**Sensitivity analysis and Monte Carlo simulation**
11:30 - 12:15	lecture	AS	**Likelihood functions**
14:30 - 17:30	practice	TN	Practice of likelihood functions and sensitivity analysis

19:00	*barbecue*		*At the lake*

Tuesday, June 17 : Introduction to Bayesian Analysis

08:30 - 09:15	lecture	DK	**Illustration of Bayesian inference**
09:30 - 10:15	lecture	AS	**Concepts of Bayesian inference**
10:45 - 11:30	lecture	CA	**Bayesian computation with Monte Carlo methods**
11:45 - 12:30	lecture	DK	**Improving models using posterior diagnostics**
14:30 - 17:30	practice	CC/TN	Practice of elementary Bayesian inference

Wednesday, June 18 : Advanced Bayesian Computation

08:30 - 09:15	lecture	DK	**Identifiability analysis**
09:30 - 10:15	lecture	CA	**Advanced Bayesian inference algorithms**
10:45 - 11:30	lecture	?	**Overview of ML techniques for Bayesian inference**
11:45 - 12:30	lecture	MBJ	**Variational inference**
14:30 - 17:30	practice	AB	Practice of Bayesian inference / advanced methods

Thursday, June 19 : Triggs and Gäggs

08:30 - 09:00	lecture	DK	**Optimization techniques**
09:15 - 09:45	lecture	?	**Emulators**
10:00 - 10:30	lecture	AS	**Probabilistic programming languages**
10:45 - 12:30	discussion	all	**Discussion of problems of the participants**

				Room 1	Room 2
14:30 - 15:30	lecture/practice	HM		Inference with hierarchical models	Repetition (AS) / problems of participants
15:30 - 16:30	lecture/practice	AB		ABC inference for stochastic models	
16:30 - 17:30	lecture/practice	HM		.	

Friday, June 20 : Applications in Ecology and Hydrology

08:30 - 09:15	lecture	PR	**Stochastic models in hydrology and ecology**
09:30 - 10:15	lecture	DK	**Hydrological modeling, uncertainty and hypothesis testing**
10:45 - 11:15	discussion	all	**Discussion of problems of the participants**
11:30 - 12:00	discussion	all	**Summary of the course**
12:00 - 12:30	discussion	all	**Feedback to the course**
14:30 - 16:30	cleaning	all	

Link to the exercises: https://www.eawag.ch/summerschool/exercises