


Data:	PFODA. MA. / Examination number: 12107	Version: 04.12.2023 	Start Year: SoSe 2025
Module Name:	<b>Probabilistic Forecasting and Data Assimilation</b>		
(English):	Probabilistic Forecasting and Data Assimilation		
Responsible:	<a href="#">Starkloff, Hans-Jörg / Prof. Dr.</a> <a href="#">Sprungk, Björn / Prof. Dr.</a>		
Lecturer(s):	<a href="#">Sprungk, Björn / Prof. Dr.</a>		
Institute(s):	<a href="#">Faculty of Mathematics and Computer Science</a> <a href="#">Institute of Stochastics</a>		
Duration:	1 Semester(s)		
Competencies:	At the end of the course the students are able to <ul style="list-style-type: none"> <li>• to explain stochastic dynamical systems and ensemble forecasting methods for those,</li> <li>• to tell basics of Bayesian inference and filtering,</li> <li>• to understand and apply common iterative filtering methods to time-discrete dynamical systems and to use their results critically.</li> </ul>		
Contents:	<ul style="list-style-type: none"> <li>• Bayesian inference and Monte Carlo methods</li> <li>• Stochastic dynamical systems and the Kalman filter</li> <li>• Variational data assimilation approaches</li> <li>• Ensemble methods for forecasting and data assimilation</li> </ul>		
Literature:	S. Reich, C. Cotter: Probabilistic Forecasting and Bayesian Data Assimilation, Cambridge University Press, 2015. K. Law, A. Stuart, K. Zygalakis: Data Assimilation - A Mathematical Introduction, Springer, 2015. M. Asch, M. Bocquet, M. Nodet: Data Assimilation - Methods, Algorithms, and Applications, SIAM, 2016.		
Types of Teaching:	S1 (SS): Data Assimilation / Lectures (2 SWS) S1 (SS): Data Assimilation / Exercises (1 SWS)		
Pre-requisites:	<b>Recommendations:</b> <a href="#">Stochastische Prozesse, 2021-05-10</a> <a href="#">Stochastik für Mathematiker, 2021-05-10</a>		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP [30 min]		
Credit Points:	5		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP [w: 1]		
Workload:	The workload is 150h. It is the result of 45h attendance and 105h self-studies.		