

<b>Course Name</b>	Mathematical Methods for Uncertainty Quantification
<b>Contents and Objectives</b>	<p><u>Content:</u></p> <ul style="list-style-type: none"> <li>• Formal methods for describing uncertainty</li> <li>• Monte Carlo sampling and related methods</li> <li>• Numerical approximation of random fields</li> <li>• Random differential equation models and their numerical solution</li> <li>• Bayesian inference and inverse problems</li> </ul> <p><u>Objectives:</u> Understanding uncertainty as an important component of modeling and simulation; familiarity with basic computational tasks for quantifying uncertainty in scientific modeling and computing as well as current approximation methods. Exercises provide opportunity to implement in MATLAB as well as theoretical problem sets.</p>
<b>Teaching</b>	<p>This course consists of lectures and exercise sessions.</p> <ul style="list-style-type: none"> <li>• Lectures: Mathematical Methods for Uncertainty Quantification (4h/week)</li> <li>• Exercises: Mathematical Methods for Uncertainty Quantification (2h/week)</li> </ul> <p>This class can be taught remotely.</p>
<b>Prerequisites</b>	Basic concepts in analysis, linear algebra, functional analysis, statistics, probability theory, partial differential equations. Familiarity with MATLAB is helpful.
<b>Verwendbarkeit des Moduls</b>	-
<b>Examination</b>	Oral exam (30 minutes)
<b>Credits</b>	8 ECTS points
<b>Frequency</b>	This course is given at least every other year.
<b>Workload</b>	The estimated total working time for this course is 240 hours.
<b>Duration</b>	This course is given during one semester.