

**Stochastic Galerkin Methods for Partial Differential Equations,  
5.0 credits**

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hp

Third-cycle education course

MAI0129

Dept of Mathematics

Valid from: First half-year 2023

**Approved by**  
Head of Department

**Approved**

**Registration number**

## Contents

Basic Concepts

Introduction

Representation of random fields via spectral expansions:

PDE Theory

## Grading

One-grade scale

## Course literature

GX08: Gottlieb, Xiu, Galerkin Method for Wave Equations with Uncertain Coefficients, *Commun. Comput. Phys.*, Vol. 3, No. 2, pp. 505-518, 2008.

PIN15: Pettersson, Iaccarino, Nordström, *Polynomial Chaos Methods for Hyperbolic Partial Differential Equations*, Springer, 2015.

TPME11: Tuminaro, Phipps, Miller, Elman, Assessment of Collocation and Galerkin Approaches to Linear Diffusion Equations with Random Data, *International Journal for Uncertainty Quantification*, Vol. 1, No. 1, pp. 19-33, 2011.

XK02: Xiu, Karniadakis, Modeling uncertainty in steady state diffusion problems via generalized polynomial chaos, *CMAME*, Vol. 191, pp. 49274948, 2002.