UNIVERSITY OF GOTHENBURG

DEPARTMENT OF MATHEMATICAL SCIENCES

NFMV019 Stochastic Partial Differential Equations, 7.5 credits

Stokastiska partiella differentialekvationer, 7,5 högskolepoäng

Third-cycle level / Forskarnivå

Confirmation

This syllabus was confirmed by the Department of Mathematical Sciences on 2021-08-12, and is valid from Autumn semester 2021.

Responsible Department
Department of Mathematical Sciences, Faculty of Science

Entry requirements

Basic knowledge in numerical analysis, probability theory, partial differential equations, stochastic processes.

Learning outcomes

After passing the course, the student will have acquired deeper knowledge about stochastic partial differential equations and the approximation of solutions to these equations.

Course content

The course will cover a suitable subset of the following topics. The final curriculum will be decided with the participants at the beginning of the course.

- Gaussian measures on Hilbert space
- Hilbert-space-valued Wiener processes and stochastic integration
- Existence and uniqueness of solutions to stochastic partial differential equations
- Strong and weak approximations of solutions with convergence analysis
- Simulation of Wiener processes
- Monte Carlo and multilevel Monte Carlo methods

Types of instruction

Besides lecture notes a list with recommended literature is distributed to all participants in the beginning of the course.

Language of instruction
The course is given in English.

Grades

The grade Pass (G) or Fail (U) is given in this course.

The grading scale comprises Fail (U) and Pass (G) with the addition of Pass with distinction (VG) for master students.

Types of assessment

There will be a project, presentations, and lectures given by the students.

Course evaluation

The course evaluation is carried out together with the students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

Other information

Teachers: Annika Lang (course leader and examiner), David Cohen, Stig Larsson.