Course on advanced stochastic processes: Diffusions and stochastic differential equations.

**Venue:** DTU Informatics.

**Schedule:** Fall 2010. Tentatively in DTU block 4A, i.e. Tuesday 13-17 starting September 1.

**Credit points (ECTS):** 5. The course is offered as a special course in the Ph.D. programme. Advanced Master's students are welcome.

**Form:** Classroom. Lectures and exercises.

**Qualified prerequisites:** The course makes use of probability, Markov processes, ordinary and partial differential equations.

**Course description:** The course aims to enable the student to examine – analytically and numerically - diffusion processes and models based on stochastic differential equations. Central in the course is the connection between the physical notion of diffusive transport, diffusion as a Markov process, and stochastic differential equations as dynamic systems driven by noise. The course features Itô calculus, the Kolmogorov equations governing transition probabilities including their numerical analysis, numerical simulation of sample paths, and filtering. In addition, one or more of the following topics will be covered: Optimal stopping, Optimal control, Local time and reflected diffusion, and Diffusion on manifolds.


**Course responsible person:** Uffe Høgsbro Thygesen, uht@aqua.dtu.dk, Henrik Madsen, hm@imm.dtu.dk, and Erik Lindstöm, erikl@maths.lth.se. The course is offered jointly by DTU Aqua, DTU Informatics, and The Mathematical Statistics Centre for Mathematical Sciences at Lund University, with support from INTERREG IV.

**Home page:** [http://www.imm.dtu.dk/~uht/sdes](http://www.imm.dtu.dk/~uht/sdes)

**Further information and registration:** Please contact Uffe Høgsbro Thygesen by e-mail.