

# Random perturbation of differential equations

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**Timetable:** 24 hrs. First lecture on May 28, 2014, 15:00 (dates already fixed, see the calendar), Torre Archimede, Room 2BC/30.

**Course requirements:** Standard knowledge of Probability and measure theory.

**Examination and grading:** Seminar on a subject assigned by the Instructors

**SSD:** MAT/06

**Aim:** The course provides an introduction to stochastic evolutions obtained by adding a random term to a differential equation. After an introduction to the finite-dimensional setting, we will deal with some infinite-dimensional problem, where the starting deterministic evolution is described by a partial differential equation.

**Course contents:**

1. Introduction to Brownian motion and stochastic integration.
2. Stochastic differential equations in finite dimensions.
3. Brownian motion and stochastic integral in infinite dimension.
4. Linear stochastic differential equations in infinite dimension. Example: stochastic heat equation and stochastic wave equation.
5. Nonlinear models of fluid dynamics: stochastic Navier-Stokes equations and related models.