

Topics in Stochastic Analysis

Prof. Sylvie Roelly¹, Prof. Paolo Dai Pra²

¹Universität Potsdam, Germany
Institut für Mathematik
Email: roelly@math.uni-potsdam.de

²Università di Padova
Dipartimento di Matematica Pura ed Applicata
Email: daipra@math.unipd.it

Timetable: 20 hours. Class meets on Tuesday and Thursday from 15:00 to 17:00.

Only the first lecture will be on **Wednesday, February 23, 2011, from 10:30 to 12:30, Room 1BC45**, Torre Archimede.

The other lectures will be given:

Thursday, February 24	15:00 - 17:00	Room 2BC30
Tuesday, March 1	15:00 - 17:00	Meeting room, floor 7, Stair B
Thursday, March 3	15:00 - 17:00	Meeting room, floor 7, Stair B
Tuesday, March 8	15:00 - 17:00	Room 2BC30
Thursday, March 10	15:00 - 17:00	Meeting room, floor 7, Stair B
Tuesday, March 15	15:00 - 17:00	Meeting room, floor 7, Stair B
Thursday, March 17	15:00 - 17:00	Room 2BC30
Tuesday, March 22	15:00 - 17:00	Meeting room, floor 7, Stair B
Thursday, March 24	15:00 - 17:00	Room 2BC30

Course requirements: Basic knowledge of Probability and Measure Theory.

Examination and grading: Homeworks and final project.

SSD: MAT/06 Probability and Mathematical Statistics

Aim: The course provides an advanced introduction to stochastic analysis. The first part of the course covers the standard program of a first course in stochastic analysis, while the second is devoted to some special topics.

Course contents:

First part (P. Dai Pra)

- Martingales
- Brownian Motion
- Ito's integral
- Ito's Formula
- Stochastic differential equations: existence, uniqueness, Markov property.

Second part (S. Roelly)

- Girsanov Formula
- Derivation in Wiener Spaces
- Integration by part formulas
- Martingale problems
- Examples: branching processes and Feller diffusions.