

Semigroup and Markov Processes

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Timetable: 20 hrs. Lectures on February/March 2012 (see the calendar), Room 2BC/30, Torre Archimede.

Course requirements: Standard knowledge of Probability and measure theory.

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

SSD: MAT/06

Aim: The course will illustrate the interplay between Functional Analysis and Probability in the construction of Stochastic Processes possessing the Markov Property.

Course contents:

I Part 1(P. Guiotto): Analytic Semigroup Theory (6 hrs.)

- Semigroups and generators
- The Hille-Yoshida Theorem
- Feller semigroups and associated Markov Processes

II Part 2 (P. Dai Pra): Construction of Markov processes: interacting particle systems (6 hrs.)

- Construction of Interacting Particle Systems
- Pathwise (graphical) constructions

III Part 3 (M. Fischer): Martingale problems and Markov processes (8 hrs.)

- Martingale problems: existence, uniqueness, duality
- The Markov property and the forward equation
- Connections with Stochastic Differential Equations