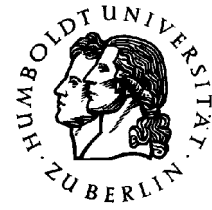


Prof. Dr. D. Becherer
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Institute of Mathematics
Stochastics



In the winter term 2019/2020 I am teaching the course (module M27)

*Selected topics in stochastic analysis:
Propagation of chaos & stochastic
dynamics with mean-field
interactions*

The course will be taught in English to facilitate participation by international students.

Contents: Some advanced topics in stochastic analysis. Topics may include, e.g., propagation of chaos, McKean-Vlasov stochastic differential equations, (controlled) dynamics with mean-field interactions and applications like mean-field- games/control, differential calculus on Wasserstein space of probability measures.

Prerequisites: Stochastic (Itô) calculus as taught in the lecture "Stochastische Analysis", that is the BMS advanced course "Stochastic Processes II". (Covering martingale theory in continuous time, stochastic integration, stochastic differential equations, martingale representation wrt. Brownian motion, etc..., see e.g. references 3-4)

References: (selected ones, further ones given during the lecture, *online accessible)

1. Carmona, Rene & Francois Delarue: Probabilistic Theory of Mean Field Games with Applications, Springer Cham, 2018
2. Sznitman, Alain-Sol: Topics in propagation of chaos. In [Ecole d'Eté de Probabilités de Saint-Flour XIX - 1989](#), P. Bernard de., Lecture Notes Mathematics 1717, Springer Berlin, 1991 *
3. Karatzas, Ioannis & Steven Shreve: Brownian Motion and Stochastic Calculus, Springer Berlin, 1991 *
4. Revuz, Daniel & Marc Yor: Continuous Martingales and Brownian Motion, Springer Berlin, 1999
5. Jacod, Jean: Calcul Stochastique et Problèmes de Martingales. Springer Berlin, 1979 *

Lecture: Tuesday, 13 – 15, RUD 25, **new room 1.012 2-006**

Classes: Tuesday, 15 – 17, RUD 25, **new room 1.012 2-006**, bi-weekly, starting **October 22nd**

First lecture: **October 15, 2019**

Office hour: by appointment

There will be a course webpage with further information, check www.math.hu-berlin.de/~becherer