

Graduate Seminar on Stochastic Analysis: Stochastic Differential Equations and Applications

Summer semester 2025, 14.00 s.t., Friday 27.6., 4.7. and 11.7. (Room 0.008)

<i>Date</i>	<i>Name</i>	<i>E-mail</i>	<i>Topic</i>	<i>References</i>
			A. Filtering	
4.7.			A1. Framework and examples, change of measure, Zakai equation, Kushner-Stratonovich equation.	A1. Bain, Crisan Section 3.1-3.6, Pardoux Ch.2, Papanicolaou Ch.4
			A2. Innovations approach, derivation of filtering equations, Kalman-Bucy filter, examples	A2. Bass Ch. 29, Øksendal Ch. 6, Papanicolaou Ch.5, Bain, Crisan 3.7 and 6.2, Liptser, Shiryaev Ch.8
			B. Optimal stopping	
27.6.			Time-homogeneous case	Bass Chapter 23, Øksendal 10.1
			Time-inhomogeneous case	Øksendal 10.2 and Exercises 10.10-10.12
			General case and variational inequalities	Øksendal 10.3 and 10.4
			C. Optimal control	
11.7.				Øksendal Chapter 11, Elliott
			D. Mathematical finance	
11.7.			Basic concepts	Øksendal 12.1, 12.2, Steele
			Option pricing	Øksendal 12.3, Steele

References:

- **Øksendal: Stochastic differential equations**
- **Bass: Stochastic Processes**
- **Bain, Crisan: Fundamentals of stochastic filtering**
- **Pardoux: Filtrage non-linéaire et EDPS associées, Lecture notes St. Flour**
- **Liptser, Shiryaev: Statistics of random processes**
- **Papanicolaou: Stochastic analysis seminar on filtering theory, <http://arxiv.org/abs/1406.1936>**
- **Elliott: Stochastic calculus and applications**
- **Steele: Stochastic calculus and financial applications**