Technische Universität Berlin
Fakultät II – Mathematik und Naturwissenschaften
Institut für Mathematik

SS 2017

Handout "Finanzmathematik II – Financial Mathematics II"

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Homepage https://isis.tu-berlin.de/course/view.php?id=10313

Lecturer and Assistant

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Classes

Lectures:	Monday	12:15 – 13:45	Prof. Dr. Antonis Papapantoleon	MA 144
	Tuesday	12:15 – 13:45	Prof. Dr. Antonis Papapantoleon	MA 042
Tutorial:	Wednesday	10:15 – 11:45	Alexandros Saplaouras	TK 017[1]
	Wednesday	12:15 – 13:45	Alexandros Saplaouras	TK 017

Prerequisites

Mandatory: "Finanzmathematik I", "Wahrscheinlichkeitstheorie I & II"
Recommended: "Wahrscheinlichkeitstheorie III" (can be attended simultaneously), "Funktionalanalysis I", "Maßtheorie"

Tutorial

We will offer two tutorials every week. The content of the two tutorials will be identical, therefore *it is only necessary to attend one of them.* You are free to choose your tutorial and there is no need to sign up for it.

Homework

There will be weekly assignments. The problem sheets will be uploaded on the webpage of the course every Wednesday. They have to be worked out and handed in **in fixed groups of three students before the tutorial on Wednesday** of the following week.

The solutions to the assignments will be discussed in the tutorial.

To be admitted to the final exam you have to obtain at least 50% of the total possible score in each half of the semester (1st half: sheets 1 – 6, 2nd half: sheets 7 – 12).

Exam

The final exam will be in **oral form**. Further information will follow.

[1] TK stands for "Gebäude Thermodynamik und Kältetechnik".

Literature

Main references:

S. Shreve, *Stochastic Calculus for Finance II: Continuous-Time Models*, Springer, 2004.

J. M. Steele, *Stochastic Calculus and Financial Applications*, Springer, 2001.

D. Lamberton, B. Lapeyre, *Introduction to Stochastic Calculus Applied to Finance*, 2nd ed., Chapman & Hall, 2007.

Stochastic analysis: Continuous semimartingales

I. Karatzas, S. Shreve, *Brownian Motion and Stochastic Calculus*, 2nd ed., Springer, 1991.

D. Revuz, M. Yor, *Continuous Martingales and Brownian Motion*, 3rd ed., Springer 1999.

Stochastic analysis: General semimartingales

Ph. Protter, *Stochastic Integration and Differential Equations*, 2nd ed., Springer, 2005.

J. Jacod, A. Shiryaev, *Limit Theorems for Stochastic Processes*, 2nd ed., Springer, 2003.

Mathematical finance:

T. Björk, *Arbitrage Theory in Continuous Time*, 3rd. ed., OUP, 2009.

F. Delbaen, W. Schachermayer, *The Mathematics of Arbitrage*, Springer, 2006.

M. Musiela, M. Rutkowski, *Martingale Methods in Financial Modelling*, Springer, 2009.

N. H. Bingham, R. Kiesel, *Risk-Neutral Valuation: Pricing and Hedging of Financial Derivatives*, 2nd ed., Springer, 2004.

M. Jeanblanc, M. Yor, M. Chesney, *Mathematical Methods for Financial Markets*, Springer, 2009.

R.-A. Dana, M. Jeanblanc, *Financial Markets in Continuous Time*, Springer, 2003.

A. Shiryaev, *Essentials of stochastic finance: Facts, Models, Theory*, World Scientific, 1999.

T. Rheinländer, J. Sexton, *Hedging derivatives*, World Scientific, 2009.

H. Föllmer, A. Schied, *Stochastic Finance: An Introduction in Discrete Time*, 3. Auflage, De Gruyter, 2011.

S. E. Shreve, *Stochastic Calculus for Finance I: The Binomial Asset Pricing Model*, Springer, 2004.

Quantitative finance:

J. C. Hull, *Options, Futures, and Other Derivatives*, 8. Auflage, Prentice Hall, 2011.

Others:

S. Cohen, R. Elliott, *Stochastic calculus and Applications*, 2nd ed., Birkhäuser, 2015.

H. Pham, *Continous-time Stochastic Control and Optimization with Financial Applications*, Springer, 2009.

D. Filipović, *Term-Structure Models: A Graduate Course*, Springer, 2009.