

Announcement WiSe 2025/26

Lecture in Mathematical Finance

Financial Mathematics 1

Prof. Dr. Aleksey Min

Area: / Modulnr.: Mathematical Finance / MA3407

Course Structure: Lecture: 4h Exercises: 2h

Content: Asset Classes, Single-Period Financial Markets, Multi-Period Financial Markets, Absence of Arbitrage and Completeness, The Binomial or Cox-Ross-Rubinstein Model, Pricing of Contingent Claims, Implementation of financial models (Binomial tree models, etc.), Optimal Portfolios in Single-Period Financial-Markets, Mean Variance Theory, Portfolio Selection, Arbitrage Pricing Theory, Capital Asset Pricing Model (CAPM), Alternative Risk Measures, Risk Adjusted Performance Measures, Integration of Expert Forecasts

Audience: MSc Mathematics, Mathematical Finance and Actuarial Science

Prerequisite: MA0009 (Introduction to Probability and Statistics), helpful: MA2409 (Probability Theory) and MA2012 (Introduction to Optimization)

Literature: **S.R. Pliska: Introduction to Mathematical Finance (2000):** Discrete Time Models, Blackwell Publishers Inc.
Shreve, S.E.: Stochastic calculus for Finance I (2004): The Binomial Asset Pricing Model. Springer Finance
N.H. Bingham und R. Kiesel: Risk-Neutral Valuation (2004): Pricing and Hedging Financial Derivatives, Springer Finance
J.C. Hull (2006): Options, Futures, and Other Derivatives, Prentice-Hall
P. Wilmott (2001): Quantitative Finance, John Wiley & Sons
E.J. Elton and M.J. Gruber (1991): Modern Portfolio Theory and Investment Analysis; John Wiley & Sons.
R., Mark (2006): A History of the Theory of Investments. Hoboken: John Wiley & Sons, Inc.
J.-P. Danthine and J. Donaldson (2005): Intermediate Financial Theory, 2nd (Academic Press Advanced Finance).

Interesting webpages of Sharpe:

<http://www.stanford.edu/~wfsarpe/art/art1.htm>

<http://www.stanford.edu/~wfsarpe/mia/mia.htm>

Certificate: Exam, 9 CP

Lecture/Exercises: see TUMonline