

# Announcement WiSe 2021/22

## Lecture in Mathematical Finance

### Financial Mathematics 1

PD 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