FINANCIAL MATHEMATICS I (273020, 5 ECTS credit points, 5 sp)

A **course** in financial mathematics is lectured (in English) at the Mathematical Department (Åbo Akademi University) starting on **Tuesday 4th of September** at 13.15 in room Hilbertrummet (ASA, Fänriksgatan 3 B, 3rd floor) during period I (4.9.–18.10.).

Lecturing hours:

Tue. 13-15, Hilbertrummet,

Wed. 10-12, Hilbertrummet,

Thu. 13-15, Hilbertrummet.

Aim is to give an introduction to the mathematical theory for basic financial derivatives.

Contents: In the first part of the course a presentation of different instruments on financial markets (e.g. interest rates, bonds, stocks, forwards, futures, options) is given. In the second part the mathematical theory of pricing and hedging of European options in the discrete time models is treated. In particular, we analyze the Cox-Ross-Rubinstein binary model in detail and derive, therefrom, the Black-Scholes formula via a limiting procedure.

Lectures are based on the following **literature**:

Bodie, Z., Kane, A., Marcus, A.J.: Investments (6th ed). McGraw-Hill (2005)

Hull, J.C.: Options, futures and other derivatives (4th edition). Prentice Hall (2000),

Lamberton, D., Lapeyre, B.: Introduction to stochastic calculus applied to finance, 2nd ed. Chapman & Hall (2008),

Panjer, H.H. (ed): Financial Economics. The Actuarial Foundation (2001),

Ross, S.M.: Introduction to mathematical finance: options and other topics, 2nd ed.. Cambridge Univerity Press (2003).

Wilmott, P., Howison, S., Dewynne, J.: The mathematics of financial derivatives. Cambridge University Press (1996).

Prerequisities: mathematical analysis (second year calculus), probability theory (a second year course).

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