



## Course syllabus

Faculty of Technology

Department of Mathematics

1MA221 Inledande finansmatematik, 7,5 högskolepoäng

1MA221 Introductory financial mathematics, 7.5 credits

### **Main field of study**

Mathematics

### **Subject Group**

Mathematics

### **Level of classification**

First Level

### **Progression**

G1F

### **Date of Ratification**

Approved by Faculty of Technology 2014-08-26

The course syllabus is valid from spring semester 2015

### **Prerequisites**

1MA201 Mathematical statistics, 7.5 hec, or equivalent. 1MA103 Vector geometry, 7.5 hec, or equivalent.

## Objectives

The student should be able to

- Account for the no-arbitrage principle
- Account for different interests: simple, periodic compounding and continuously compounding.
- Determine the present value of risk-free assets, in particular annuities, perpetuities, zero-coupon bonds and coupon bonds.
- Determine the portfolio of risky assets with smallest variance
- Determine the feasible and efficient set for portfolios of assets with and without a riskfree asset
- Account for the two-fund separation theorem, the market portfolio, the capital asset pricing model, the security market line
- Determine arbitrage-free values of forwards and futures
- Determine the present value of European put options and call options under the binomial model
- Account for the put-call parity

- Account shortly for some important properties of American options
- Account shortly for the Black-Scholes model
- Apply the Black-Scholes formula

## Content

The course content is:

- Introductory riskfree assets
- Introductory portfolio management
- Futures and forward pricing
- Option pricing, in particular European options, mainly under the binomial model, and somewhat under the Black-Scholes model
- Orientation about current research issues

## Type of Instruction

Lectures; computerbased home assignment; oral presentation, written report and opposition of a project.

## Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

Assessment of how well the student fulfills the objectives is achieved through

- written exam
- computerbased home assignment
- project work that is accounted for by a written and oral presentation
- opposition of another student's project work

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

## Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

## Required Reading and Additional Study Material

**Capinski, M. Zastawniak T., Mathematics for Finance, Springer**

Capinski, M. Zastawniak T., Mathematics for Finance, Springer, London Ltd, latest edition. 494 pages.