Linnæus University

Jnr: 2015/2067-3.1.2

Course syllabus

Faculty of Technology
Department of Mathematics

1MA521 Inledande finansmatematik, 7,5 högskolepoäng
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 2015-05-22
The course syllabus is valid from spring semester 2016

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 or yields of risk-free assets, in particular annuities, perpetuities, zero-coupon bonds and coupon bonds.
- Determine the yield curve and forward rates
- 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

Content

The course content is:

- Introductory interest rate theory
- 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 A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

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

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course:1MA221 Introductory financial mathematics, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

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.