



GÖTEBORG UNIVERSITY

Faculty Board of Science

MMA700 Options and Mathematics

7.5 higher education credits

Second Cycle

This syllabus is the binding document.

1. Confirmation

The syllabus was confirmed by the Department of Mathematical Sciences on June 15, 2007 to be valid from July 1, 2007. Field of education: Science. Responsible department: Mathematical Sciences.

2. Position in the educational system

The course Options and Mathematics, 7.5 higher education credits, is one of several single subject courses included in the two-year Masters Program in Mathematical Sciences. It is mandatory for students specialising in Mathematical Finance. The course is also open for eligible students outside the program.

3. Entrance qualifications

The prerequisites for the course Options and Mathematics are the equivalent of the courses MMG300 Multi Variable Analysis and MSG100 Probability Theory 1.

4. Course content

The Dominance Principle. Gaussian Processes and Brownian Motion. The Central Limit Theorem. The Binomial Model and Black-Scholes Model. Self-Financing Portfolios. The Black-Scholes Differential Equation. Calls and Puts. Path-Dependent Options. Dividends. Currency Derivatives.

5. Learning outcomes

After completing the course the student will be able to

- understand the pricing and hedging in the Binomial Model
- motivate the Black-Scholes prices of calls and puts of European type
- price the simplest derivatives on currencies

- master the complications in option pricing when the underlyings pay dividends
- compute American put prices by binomial approximation.

6. Required reading

List of required reading enclosed.

7. Assessment

The examination consists of assignments and a written examination. Some of the assignments are based on Matlab. A student who has failed a test twice has the right to change examiner, unless weighty arguments can be invoked. For this, the student must send a written request to the board of the department.

8. Grading scale

The grades are Fail (U), Pass (G), and High Pass (VG).

Students who are contractually entitled to ECTS grades should inform the examiner about this no later than one week after the start of the course.

Students without such entitlement will not be awarded ECTS grades. Grades will be converted into ECTS terminology according to a standard model approved by the University President.

9. Course evaluation

Oral and/or written course evaluation will be performed. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.

10. Additional information

The language of instruction is English unless all involved are Swedish speakers.