



GÖTEBORG UNIVERSITY

Faculty Board of Science

**MSA930 Thesis in Mathematical Statistics for the two-year
Masters Program in Mathematical Sciences,
specialization Finance Mathematics**

30 higher education credits

Second Cycle

This syllabus is a binding document.

1. Confirmation

The syllabus was confirmed by the Department of Mathematical Sciences on September 1, 2009 to be valid from September 1, 2009.

Field of education: Science. Responsible department: Mathematical Sciences.

2. Position in the educational system

The course MSA930, 30 higher education credits, can only be taken as a part of the two-year Masters Program in Mathematical Sciences. The course constitutes a degree project for the Master's degree in Mathematical Statistics.

3. Entrance qualifications

To qualify for the course the student should be registered in the Masters Program in Mathematical Sciences. The student must have completed the following three courses

- MMA700 Options and mathematics
- GM0701 Advanced Microeconomic Theory
- HNF635 (NEG300) Portfolio Investment (C-level course in Economics),

and at least one of the following courses

- MMA110 Integration theory
- MMA710 Financial derivatives and stochastic analysis
- MSA400 Financial risk
- MSA410 Financial time series
- MSA100 Computer intensive statistical methods

- MSA350 Stochastic calculus Part I
- MSA360 Stochastic calculus Part II
- MSA200 Multivariate statistical analysis.

4. Course content

In this project course the student works alone or in a pair investigating a specific stochastic aspect in the area of Financial Mathematics. Every such project has an advisor and an examiner. The topic of the project course is determined jointly by the examiner, the advisor, possibly a financial institution, and the student. The work typically includes

- reading relevant scientific literature,
- choosing a statistical model suitable for the project,
- application of probability theory tools and statistical methods using properly chosen computer software.

The results are to be submitted as a Master's thesis report written in English, which shall be presented orally at a seminar.

The student is supposed to spend approximately 800 hours on this course. The student has the right to 20 contact hours with the advisor (for a pair work it is 30 hours together for both students).

5. Learning outcomes

After completing the course, the student will be able to

- solve certain problems within finance using advanced mathematical tools
- follow the developments within a certain number of areas in financial mathematics
- demonstrate a deeper understanding and gained insight into state of the art knowledge within the subject of the Master's degree project
- identify and state relevant problems as well as plan and perform advanced tasks within given time frames
- give oral and written presentations of one's own and others results
- critically evaluate one's own current state of knowledge, identify the need for further knowledge, and take responsibility for acquiring the needed knowledge.

6. Required reading

Determined jointly by the examiner, the advisor and the student.

7. Assessment

The final evaluation and grading of the student's performance in the course is done by the examiner. It is based on the student's contribution to the written report, which should be clearly stated in the thesis in the case of a pair project, as well as on the seminar presentation and its

discussion.

8. Grading scale

The grades are Fail (U), Pass (G), and Pass with Distinction (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

A course evaluation will be performed during and after the course in cooperation among the student, the advisor, the examiner and the director of undergraduate studies.

10. Additional information

The course speed shall be at least 7.5 credits per quarter. It should be finished within one year following its start. Early in the course, the student together with the advisor shall establish a project plan describing the problem setting and a timetable. Such a plan covering a period of more than one year requires special approval by the director of undergraduate studies.

The timetable can be changed after approval by the director of undergraduate studies.

A student, who failed to finish this project course in accordance with the approved timetable, has no right to demand additional supervision.