

Syllabus

for course at advanced level

Mathematical Methods in Life Assurance I
Livförsäkringsmatematik I

**7.5 Higher Education
Credits**
7.5 ECTS credits

Course code:	MT7012
Valid from:	Autumn 2007
Date of approval:	2006-09-27
Department	Department of Mathematics (incl. Math. Statistics)
Subject	Mathematical Statistics
Specialisation:	A1F - Second cycle, has second-cycle course/s as entry requirements

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University on 27 September 2006.

Prerequisites and special admittance requirements

Prerequisites for the course are knowledge equivalent to 30 hp in Mathematical Statistics, including Mathematical analysis III FC, 7.5 hp (MM5001), Linear Algebra II FC, 7.5 hp (MM5004), Statistical analysis FC, 7.5 hp (MT4001) and Stochastic processes and simulation I FC, 7.5 hp (MT4002). Also required is knowledge equivalent to Swedish upper secondary school course English B or equivalent to one of the following tests; Cambridge CPE and CAE: Pass, IELTS: 6.0 (with no part of the test below 5.0), TOEFL (paper based): 550 (with minimum grade 4 on the written test part), TOEFL (computer based): 213, TOEFL (internet based): 79.

Course structure

Examination code	Name	Higher Education Credits
TENT	Mathematical Methods in Life Insurance I	6
LABO	Computer Exercises	1.5

Course content

- a. The course covers
- the probabilistic foundation of life- and sickness insurance, statistical analysis of life length and mortality, calculation of premiums and reserves, risk premiums, loadings, changes and profit.
- b. The course includes the following elements:
- i) Theory, 6 hp
 - ii) Computer Exercises, 1.5 hp

Learning outcomes

- It is expected that the student after taking the course will be able to
- define basic actuarial concepts, their stochastic basis and relations to the deterministic variables in models for cash flows in a life insurance.
 - apply methods for estimation and statistical analysis of mortality and life lengths.
 - write down and understand the balance equations valid for the capital at an individual level.

- use suitable programs as an aid for the calculation of reserves in various forms of life insurance.

Education

The education consists of lectures and computer exercises. Participation in the computer exercises is compulsory. An examiner may rule that a student is not obliged to participate in certain compulsory education if there are special grounds for this after consultation with the relevant teacher.

Forms of examination

a. Examination for the course is in the following manner: measurement of knowledge takes place through written examination.

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail
F = Fail

c. Grading criteria for the course will be distributed at the start of the course.

d. A minimum grade E is required to pass the course, together with pass of computer exercises.

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term "examination" here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

Interim

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Limitations

The course may not be included in a degree together with the course "Life Insurance Mathematics" (MS 2070).

Misc

The course is a component of the Master's Programme in Actuarial Mathematics, and it can also be taken as an individual course.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.