



Course syllabus

Faculty of Technology

Department of Mathematics

4MA502 Försäkringsmatematik, 7.5 credits

Insurance Mathematics

Main field of study

Mathematics

Subject Group

Mathematics

Level of classification

Second Level

Progression

A1F

Date of Ratification

Approved 2014-10-03

Revised 2022-06-13 by Faculty of Technology. Type of instructions and literature list are revised.

The course syllabus is valid from spring semester 2023

Prerequisites

4MA501 Foundations of probability, 7.5 credits, or equivalent.

Objectives

The student should be able to:

- understand and explain the basic concepts in life and non life insurance mathematics as well as risk theory
- apply and evaluate the various methods of computing in life and non life insurance, analyze and interpret the results
- justify the choice of tools made in a coherent and concise manner
- relate the basic notions introduced in the course and apply the relation to more complex problems
- interpret, communicate on and lead an argument in topics of insurance mathematics.
- differentiate alternative risk models and premium principles and evaluate the influence of reinsurance
- assess the mathematical possibilities and limitations of risk modelling and its impact on society, e.g. solvency and climatic changes.

Content

The course contains:

- premium principles
- introduction to utility theory
- individual and collective risk models for insurance portfolios
- risk models including reinsurance
- insurance risk theory, e.g., risk processes and ruin probabilities
- introduction to life insurance mathematics (equivalence principle, Hattendorff's theorem).

Type of Instruction

Lectures and seminars.

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 assignments
- oral examination

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

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: 4MA202 Insurance 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

Required reading

Rob Kaas, Marc Goovaerts, Jan Dhaene, Michael Denuit: *Modern Actuarial Risk Theory*, latest edition, Springer, Berlin. 306 pages.

Compendium. Linnaeus University, present year.