Department of Mathematics
(incl. Math. Statistics)

Stockholm University

Education plan

for

Master's Programme in Actuarial Mathematics
Masterprogram i försäkringsmatematik, Aktuarieprogrammet

120.0 Higher Education Credits
120.0 ECTS credits

Programme code:	NAKTO
Valid from:	Autumn 2007
Date of approval:	2006-10-18
Department:	Department of Mathematics (incl. Math. Statistics)

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

Prerequisites and special admittance requirements

A Bachelor's Degree (120 credits exclusiv Degree Project) with 45 ECTS in Mathematics and 45 ECTS in Mathematical Statistics is required for admission to the programme (60 ECTS is equivalent to one year full-time studies).

Programme structure

The Master's Programme in Actuarial Mathematics is an education that leans towards students who want to provide deeper knowledge within actuarial mathematics and want to work as an actuary. The programme covers the requirements of Swedish Actuary Society to be the diplomaed actuary. The education fields are mathematics, mathematical statistics, national economy, business and law.The programme is a two year full-time study programme that is composed of courses in mathematical statistics, national economy and law on the second level. The education covers 120 credits, of which 60 credits for compulsory courses and 30 credits in mathematics and mathematical statistics elective courses . The education ends with a degree project in actuarial mathematics for 30 credits. Prerequisites are a knowledge equivalent to courses Linear Statistical Models, FC, 7.5 hp and Introduction to Finance Mathematics, FC, 7.5 hp. A student who does not have these prerequisites is recommended to study them within facultative block.

Goals

The main field of study is actuarial mathematics.
For a Degree of Master students must
- demonstrate knowledge and understanding within actuarial mathematics, both broad knowledge in the field and substantially deeper knowledge of certain parts of the field, together with a deeper insight into current research and development work,
- demonstrate deeper methodological knowledge within actuarial mathematics,
- demonstrate an ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomina, issues and situations, even when limited information is available,
- demonstrate an ability to critically, independently and creatively identify and formulate issues and to plan, and in using appropriate methods, carry out advanced tasks within specified time limits, so as to contribute to the development of knowledge and to evaluate this work,
- demonstrate an ability to clearly present and discuss their conclusions and the knowledge and arguments behind them, in a dialogue with different groups, orally and in writing, in national and international contexts,

- demonstrate the skill required to participate in research and development work or to work independently in

other advanced contexts,
- demonstrate an ability to make assessments within actuarial mathematics, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work,
- demonstrate insight into the potential and limitations of science, its role in society and people's responsibility for how it is used, and
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

Courses

Fm is stated for courses within actuarial mathematics.
Compulsory courses:
1.Mathematical Methods in Life Assurance I, SC, 7.5 hp (Fm) 2.Mathematical Methods in Life Assurance II, SC, 7.5 hp (Fm) 3.Mathematical Methods in General Insurance I, SC, 7.5 hp (Fm) 4.Mathematical Methods in General Insurance II, SC, 7.5 hp (Fm) 5.Insurance Accounting, SC, 7.5 hp 6.Economics for Actuaries, SC, 7.5 hp (givn by Department of Economics) 7.Insurance Law for Actuaries I, SC, 7.5 hp (given by Juridicum, department of Law) 8.Insurance Law for Actuaries II, SC, 7.5 hp (given by Juridicum, department of Law) 9.Actuarial Mathematics, Degree Project, SC, 30 hp.
Elective courses: The collection of elective courses is decided by the department board. The list of elective courses is brought up to date every new academic year. Before every new start of a programme there will be a list showing a minimal amount of elective courses that will be guaranted during the time of the programme. The minimum amount of credits that has to be studied in elective courses is 15 credits in mathematics and 7.5 credits in mathematical statistics.
Exampleof elective courses: 1.Probability Theory III, AN, 7,5 hp 2.Statistical models, SC, 7.5 hp 3.Stochastic processes III, AN, 7,5 hp 4.Statistical Consulting Methodology, SC, 7.5 hp 5.Martingale Theory and Stochastic Integration, AN, 7,5 hp 6.Bayesian Methods, SC, 7.5 hp 7.Generalized Linear Models, SC, 7.5 hp 8.Non-Parametric Methods, SC, 7.5 hp 9.Survival Analysis, SC, 7.5 hp 10.Advanced Finance Mathematics, SC, 7.5 hp 11.Financial Derivatives, SC, 7.5 hp 12.Combinatorics, SC, 7.5 hp 13.Ordinary Differential Equations, SC, 7.5 hp 14.Dynamic Systems and Optimal Control Theory, SC, 7.5 hp 15.Foundations of Analysis, SC, 7.5 hp 16.Analytic Functions, SC, 7.5 17.Algebra III, SC, 7.5 18.Linear Analysis, SC, 7.5 hp 19.Optimization, SC, 7.5 hp 20.Logic, SC, 7.5 hp 21.Mathematical Economics, SC, 7.5 hp 22.Development of Mathematics, SC, 7.5 hp.
Optional courses 15 credits. Prerequisites are a knowledge equivalent to courses Linear Statistical Models, FC, 7.5 hp and Introduction to Finance Mathematics, FC, 7.5 hp. A student who does not have these prerequisites is recommended to study them within facultative block. Maximum 30 credits is allowed to be chosen from first level.

Degree

Master's Degree

Misc

Students, admitted to the program and not having finished it within two years, may request that they be allowed to finish the program even after it has ceased to apply. By this the limitations given in the syllabi of the courses in the program must be taken into consideration.
Programme in cooperation with Juridicum, Department of Law and Department of Economics.