

Education plan

for

Master's Programme in Mathematical Statistics
Masterprogram i matematisk statistik

**120.0 Higher Education
Credits**
120.0 ECTS credits

Programme code: NMASO
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 with 45 ECTS in Mathematics, 15 ECTS in Computer Science and 60 ECTS in Mathematical Statistics is required for admission to the programme. Second level courses in probability theory, statistical inference theory and linear statistical models are recommended. Proficiency in English, which must be demonstrated in one of the following ways:

- * IELTS score (Academic) of 6.5 or more (with none of the sections scoring less than 5.5)
- * TOEFL score of 575 or more (internet based 90)
- * Cambridge/Oxford - Advanced or Proficiency level

Programme structure

The Master's Programme in Mathematical Statistics is an education that leans towards students who want to provide deeper knowledge within mathematical statistics. The education fields are mathematics and mathematical statistics. The programme is a two year full-time study programme that is composed of courses in mathematical statistics on the second level. The education covers 120 credits. Three courses in mathematical statistics (22.5 credits) are compulsory courses. The education ends with a degree project in mathematical statistics for 30 credits. Prerequisites are a knowledge equivalent to courses Probability Theory II, FC, 7.5 hp, Theory of Statistical Inference, FC, 7.5 hp and Linear Statistical Models, 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 mathematical statistics.

For a Degree of Master students must

- demonstrate knowledge and understanding within mathematical statistics, 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 mathematical statistics,
- demonstrate an ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, 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 mathematical statistics, 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

Ms is stated for courses within mathematical statistics.

Compulsory courses: 1. Probability Theory III, SC, 7.5 hp (Ms) 2. Statistical Models, SC, 7.5 hp (Ms) 3. Stochastic Processes III, SC, 7.5 hp (Ms) 4. Mathematical Statistics, Degree Project, SC, 30 hp (Ms).

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 guaranteed during the time of the programme.

Minimum number credits of elective courses has to be 15 credits in mathematics and 7.5 credits in mathematical statistics.

Example of current elective courses: 1. Statistical Consulting Methodology, SC, 7.5 hp (Ms) 2. Martingal Theory and Stochastic Integration, SC, 7.5 hp (Ms) 3. Bayesian Methods, SC, 7.5 hp (Ms) 4. Generalized Linear Models, SC, 7.5 hp (Ms) 5. Nonparametric Methods, SC, 7.5 hp (Ms) 6. Survival Analysis, Sc, 7.5 hp (Ms) 7. Repeated Measurements, Sc, 7.5 hp (Ms) 8. Epidemiology, SC, 7.5 hp (Ms) 9. Clinical Trials, SC, 7.5 hp (Ms) 10. Advanced Finance Mathematics, SC, 7.5 hp (Ms) 11. Financial Derivatives, SC, 7.5 hp (Ms) 12. Mathematical Methods i Life Assurance I, SC, 7.5 hp (Ms) 13. Mathematical Methods in Life Assurance II, SC, 7.5 hp (Ms) 14. Mathematical Methods in General Insurance I, SC, 7.5 hp (Ms) 15. Mathematical Methods in General Insurance II, SC, 7.5 hp (Ms) 16. Combinatorics, SC, 7.5 hp 17. Ordinary Differential Equations, SC, 7.5 hp 18. Dynamic Systems and Optimal Control Theory, SC, 7.5 hp 19. Foundations of Analysis, SC, 7.5 hp 20. Optimization, SC, 7.5 hp 21. Algebra III, SC, 7.5 22. Linear Analysis, SC, 7.5 hp 23. Optimization, SC, 7.5 hp 24. Logic, SC, 7.5 hp 25. Development of Mathematics, SC, 7.5 hp.

Optional courses 45 credits. Prerequisites are a knowledge equivalent to courses Probability Theory II, FC, 7.5 hp, Theory of Statistical Inference, FC, 7.5 hp and Linear Statistical Models, 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.