

Education plan

for

Master's Programme in Mathematical Statistics and Machine Learning
Masterprogram i matematisk statistik och maskininlärning

**120.0 Higher Education
Credits**
120.0 ECTS credits

Programme code: NMSMM
Valid from: Autumn 2023
Date of approval: 2023-02-07
Department: Department of Mathematics (incl. Math. Statistics)

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University 2006-10-18 and revised 2014-10-06, 2019-08-19.

Prerequisites and special admittance requirements

A Bachelor's degree with 45 ECTS credits in Mathematics, 15 ECTS credits in Computer Science and 60 ECTS credits 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. Also required is knowledge of English equivalent to Swedish upper secondary school course English 6.

Programme structure

The Programme consists of mandatory courses of 37.5 ECTS credits, a degree project of 30 ECTS credits, elective courses of at least 30 ECTS credits, and freely chosen (optional) courses of at most 22.5 ECTS credits.

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

Compulsory courses:

1. Probability Theory III, 7.5 ECTS credits (MT7047)
2. Statistical Models, 7.5 ECTS credits (MT7046)
3. Stochastic Processes and Simulation II, 7.5 ECTS credits (MT5012)

At least one of 4-5:

4. Computer Intensive Statistical Methods, 7.5 ECTS credits (MT7024)
5. Statistical Learning, 7.5 ECTS credits (MT7049)

At least one of 6-7:

6. Statistical Consultancy Methodology, 7.5 ECTS credits (MT8001)
7. Mathematical Communication, 7.5 ECTS credits (MM7020)
8. Mathematical Statistics, Degree Project, 30 ECTS credits (MT9013)

Elective courses of at least 30 ECTS credits, at least 7.5 credits of which must be in mathematical statistics, second cycle. 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.

Freely chosen (optional) courses of at most 22.5 ECTS credits.

A maximum of 30 ECTS credits of first cycle courses is allowed in a master's degree.

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.