Department of Mathematics
(incl. Math. Statistics)

Stockholm University

Education plan

for

Master's Programme in Mathematics
Masterprogram i matematik

120.0 Higher Education Credits
120.0 ECTS credits

Programme code:	NMKLO
Valid from:	Autumn 2020
Date of approval:	2019-10-23
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 degree corresponding to a Bachelor of 180 ECTS credits.

Knowledge (in terms of completed courses) corresponding to Mathematics III - Abstract Algebra, 7.5 ECTS credits (MM5020) and Mathematics III - Foundations of Analysis, 7.5 ECTS credits (MM5021).

Also required is knowledge of English equivalent to Swedish upper secondary school course English 6.

Programme structure

The programme is a two year full-time study programme that is composed of courses in mathematics, mathematical statistics, scientific computing, optimization, computer science of 90 credits including a degree project of 30 credits. The program also contains mandatory courses in theory of science, and communication of mathematics,
At least 60 credits must be in mathematics. In the programme there is room for optional courses of 30 credits.

Goals

The main field of study is mathematics. For a Degree of Master students must
- demonstrate knowledge and understanding in their main field of study, including 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 it the main field of study,
- 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 mehods, 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 in the main field of study, 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

Mandatory courses:
- It is mandatory to read one course in each of four areas below.
Algebra and geometry: Homological Algebra and Algebraic Topology, AL, 7.5 credits (MM8020), Commutative Algebra and Algebraic Geometry, AL, 7.5 credits (MM8019).

Analysis: Integration Theory AL 7.5 credits (MM8001), Fourier Analysis AL 7.5 credits (MM8003), Functional Analysis, AL 7.5 credits (MM8009), Partial Differential Equations, AL 7.5 credits (MM8008).

Topology: Topology, AL 7.5 credits (MM8002).

Discrete mathematics: Combinatorics III, AL 7.5 credits (MM8011), Enumerative combinatorics, AL 7.5 credits (MM8018), Number Theory, AL 7.5 credits (MM8012).

- Degree project, AL, 30 credits (MM9001).

Remark: Each of the courses listed above has a counterpart at KTH.

- Theory and Methodology of Science with Applications, 7.5 credits (KTH-AK2036) or Scientific Methods and Research Ethics 7.5 credits (SU-10293).

- Basis Communication and Teaching, 3.0 credits (KTH-LH200V).

- Mathematical communication, 4.5 credits.

Optional courses:
Optional courses in mathematics, mathematical statistics, scientific computing, optimization theory, computer science: 30 credits.

The remaining 15 credits can be chosen freely, without condition on the level.

Degree

Master's degree, joint with Royal Institute of Technology (KTH) and Stockholm University (SU).

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.
The education is given in English.