

# Education plan

for

**Master's Programme in Mathematics**  
**Masterprogram i matematik**

**120.0 Higher Education**  
**Credits**  
**120.0 ECTS credits**

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|--------------------------|--|
| <b>Programme code:</b>   | NMKLO  |
| <b>Valid from:</b>       | Autumn 2023  |
| <b>Date of approval:</b> | 2019-10-23   |
| <b>Changed:</b>          | 2022-09-07   |
| <b>Department:</b>       | Department of Mathematics (incl. Math. Statistics) |

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University on 23 October 2019 and revised 9 September 2022.

## 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 joint initiative by the departments of mathematics at Stockholm University (SU) and the Royal Institute of Technology (KTH). It is a two-year (120 ECTS credits) programme consisting of courses in mathematics, which is the main field of study of the programme, courses in subjects related to mathematics (mathematical statistics, computational mathematics, optimization theory, theoretical computer science), as well as a course in communication and a course in the theory and methodology of science. The programme contains a master's thesis in mathematics, corresponding to 30 ECTS credits.

At least 60 ECTS must be second cycle courses in mathematics. In the programme there is room for 15 ECTS credits of free elective courses.

## Goals

The main field of study is mathematics. For a Degree of Master students must

- demonstrate knowledge and understanding in mathematics, 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 in mathematics,
- 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, 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 in their 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:

- Advanced algebra, 7.5 credits (MM7033)\*;
- Advanced Real Analysis I, 7.5 credits (MM7046)\*;
- Topology, 7.5 credits (MM7052)\*;
- At least one of the three courses Enumerative combinatorics, 7.5 credits (MM7031)\*, Graph theory, 7.5 credits (MM7045)\*\*; Number theory, 7.5 credits (MM7049)\*;
- Mathematics, Degree Project, 30 credits (MM9007)\*;
- Mathematical Communication, 7.5 credits (MM7020)\*;
- Theory and Methodology of Science (Natural and Technological Science), 4,5 credits (AK2030);
- Sustainable Development and Research Methodology in Mathematics, 3 credits (SA2001).

Elective courses:

Elective courses in mathematics, mathematical statistics, computational mathematics, optimization theory and theoretical computer science, of a total of 30 credits from a particular list. The elective courses are decided by the department board. The list of all elective courses should be updated before each new academic year. Before the start of a programme, there should be a list of the minimum number of courses where teaching is guaranteed during the programme.

15 courses of free elective courses.

\*) The course is in the main field of study for the programme and has a counterpart at KTH.

\*\*\*) The course is in the main field of study for the programme.

### **Degree**

The programme leads to a masters degree, joint with Royal Institute of Technology (KTH) and Stockholm University (SU).

### **Misc**

For free elective courses, any limitations to including the course in a degree which are stated in the syllabus of each course apply.

Students who have been admitted to the programme but not completed it during the scheduled two years can request to complete the program even after the programme syllabus no longer applies. In such cases, the limitations stated in the syllabuses for the courses in the programmes apply.

The programme is given in English.