

# Syllabus

for course at first level

**Mathematics III - Combinatorics**  
**Matematik III - Kombinatorik**

**7.5 Higher Education  
Credits**  
**7.5 ECTS credits**

<b>Course code:</b>	MM5023
<b>Valid from:</b>	Autumn 2019
<b>Date of approval:</b>	2014-10-06
<b>Changed:</b>	2014-10-06
<b>Department</b>	Department of Mathematics (incl. Math. Statistics)
<b>Main field:</b>	Mathematics/Applied Mathematics
<b>Specialisation:</b>	G2F - First cycle, has at least 60 credits in first-cycle course/s as entry requirements

## Decision

This syllabus was approved by the Board of the Faculty of Science at Stockholm University on 6 October 2014. Technical revision by the Student Office 2019-04-25.

## Prerequisites and special admittance requirements

Admission to the course requires knowledge equivalent to 60 credits in mathematics, where Mathematics II – Algebra and Combinatorics, 7.5 credits (MM5013), or equivalent, is included.

## Course structure

Examination code	Name	Higher Education Credits
HELA	Mathematics III - Combinatorics	7.5

## Course content

The course covers algorithms and their effectivity, general graph theory, trees and search algorithms, graph colouring, directed graphs, recursive methods, generating functions, partitions, finite geometries.

## Learning outcomes

It is expected that the student after taking the course will be able to

- \* define basic concepts in combinatorics and graph theory
- \* account for and prove basic theorems in combinatorics and graph theory
- \* explain and use methods in combinatorics and graph theory to solve mathematical and applied problems.

## Education

Instruction consists of lectures and exercises.

## Forms of examination

a. The course is examined as follows: Knowledge assessment takes the form of a written examination.

b. Grades are assigned according to a seven-point goal-related grading scale:

A = Excellent  
B = Very good  
C = Good

D = Satisfactory  
E = Sufficient  
Fx = Fail (more work required before credit can be awarded)  
F = Total fail

c. The grading criteria will be distributed at the beginning of the course.

d. To be awarded a pass, the minimum grade E is required.

e. Students who fail an ordinary examination are entitled to sit additional examinations as long as the course is offered. There is no restriction on the number of examinations. Examinations also include other obligatory elements of the course. Students who have passed an examination may not resit it in order to achieve a higher grade. Students who have failed on two occasions are entitled to request the appointment of a different examiner for the next examination. Any such request must be made to the departmental board.

The course has at least two examinations for each academic year in the years in which instruction is provided. Intervening years include at least one examination.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

### **Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two year period after course instruction has ended. Requests must be made to the departmental board. The provision also applies in the case of revisions to the course plan.

### **Limitations**

The course may not be included in a degree together with Combinatorics II (MM7007) or equivalent.

### **Misc**

The course is a component of the Bachelor's Programme in Mathematics and the Bachelor's Programme in Computer Science. It can also be taken as an individual course.

### **Required reading**

Course literature is decided by the departmental board and described thereafter in an appendix to the course plan.