

# Syllabus

for course at first level

**Mathematics II - Algebra and Combinatorics**  
**Matematik II - Algebra och kombinatorik**

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

<b>Course code:</b>	MM5013
<b>Valid from:</b>	Autumn 2019
<b>Date of approval:</b>	2014-08-22
<b>Changed:</b>	2014-08-22
<b>Department</b>	Department of Mathematics (incl. Math. Statistics)
<b>Main field:</b>	Mathematics/Applied Mathematics
<b>Specialisation:</b>	G1F - First cycle, has less than 60 credits in first-cycle course/s as entry requirements

## Decision

This syllabus has been approved by the Board of Faculty of Science at Stockholm University 2014-08-22.  
Technical revision by the Student Office 2019-04-25.

## Prerequisites and special admittance requirements

To qualify for the course, knowledge equivalent to Mathematics I, 30 ECTS credits (MM2001), is required.

## Course structure

Examination code	Name	Higher Education Credits
HELA	Mathematics II - Algebra and Combinatorics	7.5

## Course content

The course covers modular arithmetic, Euler's phi-function, Fermat's little theorem, the RSA algorithm, relations, something about graph theory, permutations, the concepts group, ring and field, polynomial equations over finite fields, group action and error-correcting codes.

## Learning outcomes

Upon completion of the course, the student is expected to be able to:

- \* explain and use basic combinatorial methods to solve mathematical and applied problems,
- \* present and use basic methods in elementary number theory,
- \* define basic concepts in abstract algebra and derive their most basic properties.

## Education

Instruction is given in the form of lectures and exercise sessions.

## Forms of examination

a. The course is examined in the following manner: measurement of knowledge is carried out through a written exam.

b. Grading is carried out according to a 7-point scale related to the learning objectives of the course:

A = Excellent

B = Very Good  
C = Good  
D = Satisfactory  
E = Sufficient  
Fx = Insufficient  
F = Completely insufficient

c. Grading criteria for the course will be distributed at the start of the course.

d. A grade of at least E is required to pass the course.

e. Students who fail an ordinary examination are entitled to take additional examinations as long as the course is offered. There is no restriction on the number of examinations. The term "examination" here is used to denominate also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent 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. An opportunity to make up from grade Fx to the grade E is given. The examiner decides which assignments should be carried out to make up and the criteria for passing said assignments. The making up must take place before the next examination.

### **Interim**

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions within a two-year-period after the end of the course offering. A request for such examination must be sent to the departmental board. This provision is also valid in the case of revision of the syllabus.

### **Limitations**

The course may not be included in a degree together with the course Algebra and Combinatorics (MM5003), or the equivalent.

### **Misc**

The course can be taken within the Bachelor's Programmes in Mathematics, Mathematics and Philosophy, Computer Science, Biomathematics and Computational Biology, but it can also be taken as an individual course.

### **Required reading**

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